Patient 0 in the Centaur Era: Idea Contagion, Human-AI Co-Creation, and Acute Destabilization Under Network-Speed Spread

Douglas C. Youvan

doug@youvan.com

www.youvan.ai

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A new epistemic risk pattern is emerging in the centaur era: a human–AI co-creation loop can generate an idea that is both novel and highly transmissible, then release it into a network environment optimized for rapid replication. In this regime, the first "host" of the idea is not the public. It is the human originator inside the loop: Patient 0. Patient 0 may be a novice with preexisting vulnerabilities, or a healthy intellectual warrior who simply encounters an overload condition at the point of release. The core claim of this paper is descriptive: centaur novelty plus network speed yields outbreak dynamics in which time-to-impact can be shorter than time-to-verification, and the earliest, sharpest effects can strike the originator first. This framework separates two orthogonal axes that are often confused: truth-value and effect profile. A contagious idea can be true, false, or unknown, while still producing rapid behavioral synchronization, institutional stress, and psychological destabilization in a subset of exposed individuals. The goal is not to moralize, diagnose, or sensationalize. The goal is to name the mechanism: how compressed, identity-binding, high-affect packages propagate, mutate, and compete, and how a civilization can experience breakdown not through autonomous machine takeover, but through network-driven reality fragmentation and coordination failure.

Keywords: Patient 0, idea contagion, centaur cognition, human-AI co-creation, network pandemics, outbreak dynamics, epistemic climate, truth-value, effect profile, time-to-impact, verification lag, identity binding, affective load, sleep deprivation, institutional stress, narrative scaffolds, variant formation, recommender systems, coordination failure, reality fragmentation.

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1. Introduction: Why Patient 0 Matters Now

The language of the past decade has trained us to say "viral" whenever something spreads quickly online. But "viral" has mostly functioned as a stylistic adjective—an attention label—rather than a serious description of a propagation regime. In the centaur era, that casual metaphor is becoming structurally literal in the sense that ideas increasingly exhibit outbreak-like dynamics: rapid replication across channels, variant formation under remix pressure, super-spreader amplification through influencers and recommender systems, and a mismatch between time-to-impact and time-to-verification.

Within that regime, one figure becomes newly legible: Patient 0. Patient 0 is the human originator inside the human–AI co-creation loop who experiences the first full-force convergence of novelty, agency, and network feedback. Before the idea becomes a public phenomenon, it is an internal event—stabilized, refined, and compressed in the first host. Then, upon release, the first host is struck by the earliest consequences: public reaction, backlash, identity collision, responsibility shock, and the physiological costs of sustained high-arousal production. The claim is not that Patient 0 is fragile. The claim is that the centaur+network system can generate load conditions that are historically unusual: high-stakes novelty plus instantaneous global response.

This introduction frames Patient 0 not as a moral warning and not as a clinical category, but as a descriptive anchor. Studying Patient 0 forces clarity about the mechanism: how a co-created idea becomes a transmissible package, how it enters the network, and how the originator can decompensate—sometimes even when the core idea is likely true—because impact arrives before verification and because feedback arrives before buffering.

1.1 From "viral posts" to outbreak regimes

A "viral post" is typically understood as content that receives disproportionate attention. An outbreak regime is different. It is not defined by a single spike of engagement; it is defined by repeatable dynamics that resemble epidemiology at the population level.

In an outbreak regime, spread is not merely large; it is structured. Ideas propagate through cascades, not just through views. They exhibit super-spreader effects, where a small number of accounts, communities, or algorithmic pathways produce most of the secondary spread. They generate variants, as people remix, paraphrase, distort, or reframe the package to fit local norms. They show half-lives and reactivations: the idea decays in attention, then returns when events supply new "fit." They also generate antagonistic counter-strains that paradoxically increase total visibility by keeping the object in the attention stream.

These features are now common because the distribution medium has changed. The internet is not just a broadcast channel; it is an adaptive routing system. Content is not simply posted; it is

selected, recommended, and amplified by mechanisms that reward engagement. Under these conditions, “viral” becomes less like a rare fluke and more like a predictable phase in an idea’s life cycle if the package meets certain fitness conditions.

Calling this an outbreak regime does not imply that the content is false, malicious, or pathological. It implies that propagation has entered a nonlinear domain where small initial signals can produce large collective effects, and where the dynamics of spread can dominate the question of truth for long enough to shape real-world outcomes.

1.2 The centaur shift: cheap iteration, polished compression, fast release

The second change is upstream: idea production itself has accelerated. The centaur shift refers to the transformation of the authoring environment when a human works in a tight loop with a powerful generative system.

Iteration becomes cheap. A person can explore many framings, metaphors, arguments, and story arcs in a single sitting. They can test tone and structure, simulate objections, and generate multiple “strain” versions tailored to different audiences. They can produce not only the core claim, but also the surrounding scaffolding that makes the claim portable: slogans, threads, titles, summaries, and responses to critics.

Compression becomes polished. Long reasoning chains can be distilled into compact tokens that travel well: a phrase, a dichotomy, a moral sorting, a single explanatory key. This compression is not automatically deceptive. It is often simply effective communication. But it changes the risk landscape because the compressed token can become outbreak-capable long before evidential grounding is complete or boundary conditions are settled.

Release becomes fast. In earlier eras, the transition from private thought to public release often passed through friction: editorial steps, peer feedback, institutional gatekeeping, or simple time delay. In centaur production, the output can feel publication-ready quickly. The author experiences a kind of convergence: the idea is not only formed but formatted. In a network environment that rewards novelty and clarity, the temptation to release is strong—and the time between incubation and public exposure shrinks.

This is the centaur-era supply-side condition for idea contagion: more candidate packages, produced faster, in higher polish, with variants already adapted to different audiences. Whether the idea is true or false is not the point at this stage. The point is that the system can now manufacture outbreak-capable packages at scale.

1.3 Patient 0 as the first host and first casualty of feedback

Patient 0 is the person who releases the package and then receives the first wave of consequences while the wider system is still forming its response. The phrase “first casualty” is

not meant to dramatize. It is meant to name a structural asymmetry: the originator experiences maximum agency and maximum feedback simultaneously, often without institutional buffering.

Three forces converge at the point of release.

First is salience load. The originator often experiences the idea as high-stakes, even world-relevant, because it was incubated under sustained attention and iterative reinforcement. The internal sense of importance can be intense, regardless of whether the idea later proves correct.

Second is responsibility load. Releasing a contagious package can produce an immediate moral accounting in the originator's mind: if this spreads, what have I set in motion? This can occur even when the intent is prosocial. Responsibility is not pathology. It is a rational response to perceived leverage.

Third is feedback shock. The network responds quickly and often harshly. The first wave can include praise, ridicule, misinterpretation, appropriation, threats, reputational attack, or demands for certainty. Even positive feedback can be destabilizing if it creates sudden expectations: the originator is pressured to become a leader, to respond instantly, to carry the movement, to defend every variant.

Under these conditions, Patient 0 can decompensate not because they are delusional and not because the idea is false, but because the load exceeds recovery capacity. Sleep disruption, sustained arousal, and social aggression are sufficient to produce acute instability in many people. The originator is also uniquely exposed to the feeling of being at the center of events, which can intensify threat perception and responsibility shock.

This is the point where the paper's earlier orthogonality becomes practically crucial: truth-value does not immunize against destabilization. A true idea can still produce an acute crash if it is released into a hostile or chaotic environment at speed, and if the originator's physiological and social buffers are inadequate for the resulting feedback wave.

1.4 Descriptive scope: mechanism before judgment

This paper does not attempt to diagnose individuals, demonize platforms, or assign moral blame to co-creation itself. The aim is to define a mechanism: how centaur novelty production and network-speed transmission create outbreak conditions for ideas, and why the originator—Patient 0—can become the first visible casualty even when the content is not obviously irrational.

To keep the analysis clean, the paper adopts several boundary choices.

First, it separates transmission from endorsement. Sharing is not belief; belief is not action; action is not long-run impact. Each layer must be treated distinctly.

Second, it separates epistemic status from effect profile. An idea can be true, false, or unknown, while its consequences can be beneficial, harmful, or mixed. Confusing these dimensions produces either censorship panic ("they're suppressing truth") or complacency ("it's false so it can't matter"). Outbreak regimes punish both mistakes.

Third, it treats psychological destabilization as a load phenomenon rather than a moral defect. The phrase "without pathologizing" is not rhetorical politeness; it is analytical accuracy. In a high-speed, high-stakes feedback environment, acute breakdown can be a predictable outcome of stress, sleep loss, and identity collision, even in capable minds.

Finally, the paper's goal is vocabulary. When a system changes regime, old terms become too blunt. "Viral," "misinformation," "propaganda," and "mass hysteria" each capture part of the landscape while obscuring other parts. Patient 0 is introduced as a clarifying term: it names the upstream human locus where incubation and first impact meet. Once that locus is visible, the rest of the outbreak dynamics—packaging, super-spreaders, variants, truth/impact mismatch, and institutional lag—can be described with greater precision and less heat.

The sections that follow build from this anchor. They formalize the idea package, describe centaur incubation, map transmission mechanics, separate truth-value from effect profile, and then return to Patient 0 as the point where individual destabilization can become a signal event in a wider coordination crisis.

2. Core Definitions: What We Mean by Idea Contagion

A serious discussion of "idea contagion" requires that we define terms with enough precision to keep the metaphor from drifting into poetry. The aim is not to force the phenomenon into perfect biological equivalence. The aim is to identify the structural similarities that make the contagion vocabulary useful: replication through exposure, amplification through super-spreaders, mutation into variants, half-life dynamics, and ecological competition for attention. Once these similarities are named, we can analyze outbreaks without assuming the ideas are false, without requiring centralized intent, and without turning every rapid spread event into moral hysteria.

In this paper, idea contagion refers to a specific regime: ideas are packaged for portability, released into low-friction channels, selected and amplified under attention incentives, and adopted in ways that can reorganize behavior and institutions before verification catches up. The definition is meant to be descriptive rather than accusatory. It makes room for beneficial contagions (coordination, reconciliation) and harmful contagions (scapegoating, zero-sum escalation), as well as ambivalent contagions (destabilizing truths). It also makes room for the

centaur era's distinctive feature: synthetic packaging—co-designed and optimized through human–AI iteration.

2.1 The transmissible package: claim, frame, call to action

An "idea" in ordinary speech can mean almost anything: a hypothesis, a mood, a worldview, a slogan, a moral stance, a policy proposal. For outbreak analysis, that ambiguity is unhelpful. What spreads most reliably is not raw content but a transmissible package.

A transmissible package has three components.

The claim is the content assertion. It can be descriptive ("this is happening"), causal ("this causes that"), interpretive ("this means that"), or normative ("this should be done"). Claims vary in evidential burden, but outbreak dynamics often allow claims to travel before evidence is stabilized.

The frame is the interpretive lens that tells the listener how to place the claim inside a world-model. Frames supply salience: why this matters, what kind of event it is, what category it belongs to, who the heroes are, who the villains are, and what counts as proof. A claim without a frame travels poorly because it is inert. A frame without a claim can still travel as mood, identity, or stance, but it is harder to anchor into action.

The call to action is the behavior hook. It can be explicit ("share this," "vote," "boycott," "report," "join," "pray," "donate," "punish"), or implicit ("treat these people as enemies," "reinterpret events through this lens," "refuse institutional authority"). Calls to action are crucial because outbreak significance is not determined by belief alone. It is determined by what people do and what institutions are forced to do in response.

The package, not the claim, is the unit of contagion. In outbreak regimes, frames and calls to action often carry more transmission power than evidential content. People may repeat the package for identity signaling or moral alignment even when they cannot defend the claim. This is why outbreak analysis must treat "adoption" as layered: repeating, endorsing, acting, and defending are separable behaviors.

Packaging also includes auxiliary features that increase portability: slogans, metaphors, enemy images, urgency cues, credibility skins, and preemptive rebuttals. These are not decorations. They are the aerodynamic shaping of the idea for travel.

2.2 Contagion as low-friction replication under attention selection

Contagion, as used here, does not mean "irrational crowd behavior." It means replication under conditions where copying is easy and incentives favor rapid spread.

Low-friction replication is the technical condition. A person can forward, repost, quote, clip, screenshot, or paraphrase with near-zero cost. Distribution is not limited by printing presses,

editorial approval, or physical proximity. In many cases, a single person can expose thousands or millions within minutes.

Attention selection is the ecological condition. Platforms and communities do not distribute content neutrally. They select it. Selection occurs through algorithms optimized for engagement, through influencers and aggregators who curate, and through community norms that reward certain kinds of speech. The effect is evolutionary: variants that hold attention, recruit emotion, and bind identity tend to survive and propagate.

Idea contagion therefore refers to a coupled system: replication plus selection. Replication ensures the package can travel. Selection ensures certain packages travel more than others. Together, they produce outbreak behavior: nonlinear growth, rapid cascades, and dominant strains.

This definition also clarifies an important point: contagion is not synonymous with persuasion. A person can replicate a package without being persuaded by it. People share to mock, to warn, to belong, to signal, or to provoke. Yet replication still increases exposure, and exposure still increases the probability of adoption somewhere in the chain. Outbreak dynamics are therefore driven by transmission behavior as much as by belief formation.

Finally, contagion implies temporal mismatch. In an outbreak regime, the package's travel time can be far shorter than the time required for responsible verification. The contagion vocabulary is useful precisely because it names that mismatch as a structural feature rather than a moral scandal.

2.3 Distinctions: misinformation, propaganda, diffusion, moral panics

Idea contagion overlaps with several established concepts, but it is not reducible to any of them. Distinguishing terms prevents the framework from becoming a rhetorical weapon.

Misinformation centers on falsity. It asks whether a claim is wrong, and how wrong claims spread. That is important, but it can mislead in outbreak regimes because contagious packages can be true, false, or unknown at the time of maximum spread. The key diagnostic feature of contagion is not falsity; it is replication dynamics under low friction and attention selection.

Propaganda centers on intent and power. It asks whether messaging is organized to manipulate, often by institutions or states. Propaganda is real and sometimes decisive, but idea contagion can occur without a central planner. In decentralized networks, contagious packages can emerge from many small optimizations, community incentives, and algorithmic routing. Propaganda may exploit contagion mechanics, but contagion mechanics do not require propaganda.

Diffusion of innovations centers on gradual adoption through social systems. It is powerful for describing how new tools and practices spread over time. But outbreak regimes often display nonlinear bursts, rapid moral sorting, and variant warfare that exceed classical diffusion models. Contagion language captures the speed and mutation dynamics that diffusion language can underemphasize.

Moral panics center on disproportionate fear and scapegoating. They describe a subset of harmful outbreaks, particularly those involving sensational narratives and social control. But contagion must also cover prosocial outbreaks (coordination and reconciliation) and ambivalent outbreaks (destabilizing truths). If the framework collapses into "everyone is panicking," it fails to describe half of what is happening.

Idea contagion is therefore best seen as a regime descriptor: it describes a transmission environment and a packaging strategy that can attach to many kinds of content and many kinds of moral valence. Its analytical advantage is that it keeps truth, intent, and proportionality as separate questions rather than presuppositions.

2.4 Synthetic in the epistemic sense: co-designed, iterated, optimized

The word "synthetic" is often emotionally loaded because it evokes engineered pathogens and deliberate harm. This paper uses "synthetic" in a narrower epistemic sense: the idea package is co-designed through a human–AI loop and iteratively optimized for clarity, portability, and persuasive force.

Synthetic, in this sense, has several features.

First, it is co-authored at the level of shaping, even if the human remains the final moral agent. The package emerges from interaction: prompts, revisions, alternative drafts, and refinements.

Second, it is iterated rapidly. The idea is not simply spoken once and released. It is tested in multiple forms, with objections anticipated, with slogans refined, and with variants prepared for different audiences. This increases fitness for replication.

Third, it is optimized under constraints. Optimization can be benign—better clarity, better pedagogy—or strategic—better virality, better identity binding. The key descriptive fact is that the package can be engineered for spread using the same loop that generated the concept.

Fourth, synthetic packages often have high polish early. They can appear mature before they are epistemically matured. Formatting, tone, and coherence can be achieved quickly, which can create a gap between presentation quality and evidential grounding.

Calling a package synthetic does not mean it is false. It means its transmissible form is the product of deliberate shaping, often with capabilities that exceed traditional single-author drafting speed. This matters for outbreak analysis because it changes the baseline: the

environment is not only selecting among naturally occurring variants; it is increasingly receiving pre-optimized variants at release.

In the centaur era, “synthetic” can therefore describe an upstream condition that increases outbreak probability: more high-fitness packages, introduced more frequently, into a network ecology that is already primed to amplify what spreads. Once these definitions are in place, the next step is to examine the centaur incubation chamber itself: how a private iterative process becomes a public outbreak-capable token, and why Patient 0 is uniquely exposed at the moment the package crosses the boundary from internal convergence to external feedback.

3. The Centaur Incubation Chamber

Before an idea becomes contagious in public, it becomes coherent in private. In the centaur era, that private coherence is increasingly produced inside a human–AI loop that acts like an incubation chamber: a controlled environment where candidate ideas are generated, tested, refined, and compressed into transmissible form. The term “incubation” is used in the descriptive sense: an interval in which a package develops properties that later increase its capacity to spread. The incubation chamber is not automatically manipulative or harmful. It is a productivity environment. But productivity environments have signatures, and those signatures matter when the output is released into a network that selects for contagiousness.

The key difference from earlier authorship is the coupling of three capacities in one workflow: high-volume generation, rapid critique-and-repair, and immediate formatting for distribution. In a single session, a centaur pair can produce an explanatory chain, generate counterarguments, rehearse responses to critics, invent a slogan, draft a long-form essay, and condense the whole thing into a one-line token. In older regimes, these steps were often separated by time, by social feedback, or by institutional friction. The centaur loop collapses them into a continuous process. That collapse increases creative power, but it also increases the probability that a package becomes outbreak-capable before it is epistemically stabilized, socially buffered, or emotionally cooled.

This section describes the incubation chamber in four parts: the loop as a shaping environment, the compression pathways that produce portable tokens, the ownership effects that intensify commitment, and the novelty multiplier that generates multiple competing packages at speed.

3.1 The loop as pre-release shaping environment

A centaur loop is not simply “asking a model questions.” It is an iterative design environment. The human supplies goals, constraints, values, and taste. The AI supplies rapid generation, stylistic variation, argument completion, and option expansion. Together, they create a feedback system that tends to increase coherence, clarity, and confidence with each iteration.

Several features make this loop a distinctive pre-release environment.

First, it is high-bandwidth and low-cost. Drafting and revising can happen continuously. Each prompt is an experimental probe: “say it this way,” “anticipate objections,” “make it shorter,” “make it stronger,” “make it more compassionate,” “make it more technical.” The loop acts like a micro-laboratory for rhetorical and conceptual tuning.

Second, it is psychologically reinforcing. Each iteration can feel like progress toward convergence. The human experiences a sequence of small confirmations: the idea becomes clearer, objections are answered, the narrative hangs together, the argument is tightened. Even when the AI is offering plausible scaffolding rather than demonstrated evidence, the experience can be one of increasing solidity. This is not necessarily delusion. It is a normal human response to a system that rapidly produces coherent outputs in response to one’s intent.

Third, the loop is private, which changes the calibration of doubt. In public, social friction forces early humility: critics appear, reputational risk is present, and uncertainty must be managed. In private incubation, the human can pursue coherence without immediate social penalty. That can be liberating and productive. It can also reduce exposure to disconfirming signals in the early phase, because the loop does not automatically supply the social resistance that would occur in a wider arena unless the human deliberately requests it.

Fourth, the loop can simulate dialogue at scale. The human can ask the system to adopt different personas: skeptic, supporter, domain expert, hostile critic, sympathetic editor. This can improve robustness by surfacing counterarguments. But it can also create a sense that “the debate has already been held,” because the author has rehearsed multiple positions. In outbreak regimes, this rehearsal advantage can make the originator’s package appear unusually prepared and confident at release, which increases transmissibility.

In short, the centaur loop is a shaping environment that can increase the fitness of an idea package before it encounters the selection pressures of the public network. That is why it functions as an incubation chamber in the contagion framework.

3.2 Compression pathways: from long reasoning to shareable tokens

One of the most consequential functions of the incubation chamber is compression: the conversion of long reasoning chains into short, portable tokens that can survive the copy-paste ecology.

Compression is not inherently corrupt. Human communication always compresses. But in outbreak regimes, compression is a primary determinant of spread because networks reward what can be carried quickly across contexts.

Several compression pathways recur.

Sloganization is the most obvious. A complex claim becomes a line that can be repeated. Often the slogan functions as a handle: it points to a larger argument that most sharers have not read. The slogan becomes the public unit, and the longer reasoning becomes optional metadata.

Dichotomization is another. The world is split into two categories: truth vs lie, awake vs asleep, good vs evil, freedom vs control, science vs denial, people vs elites. Dichotomies travel because they offer closure and identity sorting. They reduce nuance, which can be harmful, but their spread advantage is large.

Metaphorization compresses causality. A phenomenon becomes “an infection,” “a machine,” “a scam,” “a cult,” “a prison,” “a firewall,” “a spell.” Metaphors travel because they import a whole inference structure. Once the metaphor is accepted, the rest of the argument feels obvious. This is why metaphors can be both enlightening and dangerous in outbreak conditions.

Narrative tokenization compresses explanation into story. A single anecdote becomes the carrier of a general claim. Stories are portable because they are memorable and emotionally loaded, and because they invite moral inference. In outbreak regimes, stories often outcompete statistics because they are easier to retell and easier to map onto identity.

Checklist compression converts complex action into a simple procedure. This can be prosocial when it spreads coordination protocols. It can be antisocial when it spreads recipes for harassment, evasion, or ideological enforcement. In both cases, the spread advantage comes from actionable simplicity.

The centaur loop accelerates all of these pathways because it can produce many candidate compressions and test them for readability and punch. A human can ask for ten slogans, ten metaphors, ten summaries, ten versions aimed at different audiences. The loop then becomes a selection environment before public release, increasing the chance that the released token is already near-peak fitness for transmission.

A crucial consequence follows: the token can travel independently of the reasoning that produced it. Once released, it can be adopted, mutated, and weaponized by people who never encounter the original argument. That separation between token and chain is one reason why outbreak regimes generate instability: the public conversation becomes about the token, while the underlying reasoning—if it exists—cannot propagate at the same speed.

3.3 Ownership effects: co-creation and commitment intensification

The incubation chamber does not only shape the package. It shapes the author.

Co-creation produces ownership effects: psychological commitments that are intensified because the person participated in the package's formation. This is true of all authorship, but centaur co-creation has distinctive features that can deepen the effect.

First, the loop produces a sense of earned convergence. The human has seen multiple drafts, asked multiple questions, tested multiple counterarguments, and watched the package tighten. The resulting output feels not like a random inspiration but like a product of labor. Labor increases attachment.

Second, the loop produces micro-consents. Each iteration is a small endorsement: "yes, say it that way," "yes, that captures it," "yes, that's the right framing." Over time, these micro-consents accumulate into a strong sense that the package reflects the author's mind. This intensifies the identity link between person and idea.

Third, the loop can create a feeling of partnership. Even when the author knows the system is a tool, the interactive quality can evoke collaboration. Collaboration increases loyalty to the output because it feels like something made within a relationship, not merely something written.

Fourth, co-creation can increase defensiveness under attack. If the package is criticized, the author is not only defending a claim; they are defending the time, effort, and self-investment that produced it. In outbreak conditions, where criticism can be harsh and rapid, this can contribute to escalatory cycles: the originator responds quickly, sleeps less, engages more, and becomes further locked into the conflict.

Ownership effects matter for Patient 0 because they intensify the feedback coupling at release. Praise can inflate responsibility expectations. Criticism can feel like personal invalidation. Misinterpretation can feel like theft. Variant distortions can feel like betrayal. The psychological burden of being the originator is not only reputational; it is relational to the idea itself.

In contagion terms, ownership also increases shedding. A person who feels strong ownership is more likely to repeat and defend the package, to correct variants, to issue clarifications, and to engage with spread. That engagement can increase the outbreak's intensity, and it can increase the author's exposure to the network's emotional turbulence.

3.4 The novelty multiplier: competing candidate packages at speed

A final feature of the incubation chamber is sheer volume. The centaur loop can generate many candidate packages quickly, and it can generate them across different framings and moral grammars. This creates a novelty multiplier: the author is not choosing between one idea and silence; they are choosing among many outbreak-capable candidates.

This has several implications.

First, it increases the likelihood that at least one package will be highly fit for transmission. In evolutionary terms, more variation increases the chance of discovering a strong replicator. The author may not even intend virality; fitness emerges as a byproduct of iteration.

Second, it increases internal competition. The author may experience a swarm of plausible frames and counterframes. This can be cognitively exhilarating, but it can also be destabilizing, especially under sleep loss or high stakes, because the mind is juggling multiple world-models and action implications simultaneously.

Third, it accelerates variant pre-diversification. Instead of one package mutating slowly in public, multiple strains can be released early: a technical version, a moral version, a narrative version, a satirical version. This can increase reach across subcultures, but it can also increase confusion because audiences argue past each other, each responding to a different strain.

Fourth, it increases the risk of ecological turbulence. If many centaur pairs in the wider world are generating high-fitness packages simultaneously, the public sphere becomes saturated with competing outbreaks. Attention becomes a scarce resource, and selection pressures favor the most emotionally activating and identity-binding strains. In such an environment, even well-intentioned ideas can be forced into conflict posture simply to survive visibility.

The novelty multiplier also reframes “civilization breakdown” risk. The danger is not a single rogue AI optimizing paperclips. The danger is a field condition: many novel packages, released quickly, competing under attention selection, producing rapid shifts in shared reality and rapid stress on institutional digestion. Patient 0 is the local origin of one such package, but the broader phenomenon is ecological. The incubation chamber is therefore not just a personal workspace. It is a new kind of upstream engine feeding a downstream selection environment.

With the incubation chamber defined, the next section can return to Patient 0 explicitly: what happens at the boundary crossing from private convergence to public feedback, why acute destabilization can occur even without epistemic error, and how that individual event can become a signal amplifier inside the wider outbreak ecology.

4. Patient 0: Acute Destabilization at the Point of Release

Patient 0 is not a diagnosis. Patient 0 is a position in a system: the first human host inside the centaur loop whose internal convergence crosses a boundary into public replication. In that boundary crossing, the originator becomes the first point where three forces stack at once: the idea's felt significance, the author's sense of agency, and the network's immediate response. That stack can produce acute destabilization even when the person is intelligent, competent, and sincere, and even when the core idea is likely true. The defining feature of Patient 0 is not fragility; it is exposure to a historically unusual load profile.

This section describes that load profile and the most plausible pathways to an acute episode at the release moment. The emphasis remains descriptive: how destabilization can occur without reducing the originator to pathology or reducing the event to "bad ideas." In outbreak regimes, the originator is often the first person to be hit by consequences, because they are both the source and the focal point of feedback while the wider ecosystem is still unbuffered.

4.1 The release moment: maximum salience, maximum agency, maximum feedback

The release moment is the transition from private coherence to public contest. In ordinary authorship, this transition can be gradual. Drafts circulate. Editors push back. Time delays soften emotional intensity. In the centaur era, release can be immediate: a polished token exits the incubation chamber and enters a network built for rapid amplification.

At release, Patient 0 often experiences maximum salience. Salience is not simply excitement; it is the sense that the idea reorganizes what matters. In the incubation chamber, salience is amplified by repeated attention and iterative reinforcement. The originator has spent time inhabiting the idea's world-model. The idea becomes a lens. Releasing it can feel like revealing something essential or urgent.

At release, Patient 0 also experiences maximum agency. The originator knows, at least implicitly, that they introduced the package. They may feel leverage: a small act has large potential consequences. Agency can be energizing, but it can also be heavy. If the idea spreads, Patient 0 will not experience it as an abstract cultural event. They will experience it as something they set in motion.

At release, Patient 0 experiences maximum feedback. The network answers quickly. The feedback is not a single signal; it is a storm of signals: praise, hostility, mockery, misinterpretation, appropriation, demands for clarification, accusations of harm, accusations of censorship, and requests for leadership. Even when attention is positive, it can be destabilizing because it raises expectations and increases pressure to respond continuously.

This triple maximum creates a distinctive risk: the originator's internal arousal rises while the external environment becomes unpredictable. The person is attempting to manage a rapidly

evolving public narrative at the same time as their own physiological and emotional systems are activated. In this configuration, it is easy for recovery capacity to fall behind load.

4.2 Two pathways: preexisting vulnerability vs overload without prior fragility

The Patient 0 event can occur through at least two broad pathways. The point of naming them is not to label individuals, but to clarify that "ending up in a hospital" does not require a single explanation. Different mechanisms can produce similar visible outcomes.

One pathway involves preexisting vulnerabilities. These can include mood instability, anxiety sensitivity, trauma loading, psychosis-proneness traits, substance interactions, or chronic sleep disruption. In such cases, the release moment acts as an acute trigger: a surge of arousal, a collapse of sleep, and a rapid escalation of perceived stakes. The network's speed can compress days of stress into hours. The person may become unable to regulate attention, emotion, or basic functioning under the combined pressure of salience and social feedback.

A second pathway involves overload without prior fragility. This is the "healthy intellectual warrior" pathway: a person with no clinically meaningful history can still decompensate when exposed to sustained high arousal, sleep loss, and social threat at scale. In this pathway, the destabilization is less about latent vulnerability and more about load exceeding biological and cognitive limits. The key drivers are often mundane: long work sessions, adrenaline from a perceived breakthrough, continuous engagement with replies, and a relentless sense of responsibility. Under sufficient sleep loss and threat perception, almost anyone can develop cognitive instability, emotional volatility, and impaired reality-testing in the practical sense of misreading intentions, over-attributing meaning, and catastrophizing outcomes.

These pathways can also combine. A person can be broadly robust yet carry a specific sensitivity, such as high anxiety under public scrutiny. Or a person can be highly stable in ordinary life but become vulnerable under the unique conditions of network-scale attention and moralized backlash. The descriptive point is that Patient 0 is a high-risk role under outbreak conditions, even when the person is not "sick" in any ordinary sense.

4.3 Burden mismatch: responsibility shock, backlash shock, meaning shock

Acute destabilization at release can be understood as burden mismatch: the burden imposed by the role exceeds the person's available buffers. Three forms of shock are especially common in the Patient 0 position.

Responsibility shock occurs when the originator suddenly feels the moral weight of downstream consequences. An idea that feels likely true can carry enormous implications. Patient 0 may experience a rapid internal escalation: "If this is right, then everything changes." That thought is not inherently pathological. It is a rational recognition of stakes. The destabilizing element is timing. Responsibility shock arrives before institutions, peers, and procedures can share the

burden. The originator carries the full load alone, often in real time, while the network accelerates.

Backlash shock occurs when the first wave of response contains hostility, ridicule, threats, or intense moral condemnation. In outbreak environments, backlash can be immediate and disproportionate. Even the perception of being targeted can trigger sustained physiological stress. Backlash shock is amplified by the ambiguity of online hostility: the originator cannot easily tell whether they are encountering a transient swarm, a permanent reputational collapse, or a genuine personal threat. That uncertainty can keep arousal elevated and sleep disrupted, which then feeds cognitive instability.

Meaning shock occurs when the idea reorganizes the originator's relationship to reality, identity, or vocation. Some ideas do not merely propose a policy; they reframe what counts as truth, what counts as good, and what counts as betrayal. Meaning shock is intensified when the public reaction mirrors the internal intensity. The originator can feel as if they are standing at a threshold: the world is splitting into those who "see" and those who "deny." Again, this can happen without delusion. Meaning shock is the consequence of a high-salience frame colliding with an environment that supplies continuous confirmation, conflict, and narrative reinforcement.

These shocks can produce a feedback loop. Responsibility motivates constant engagement. Constant engagement worsens sleep. Worsened sleep increases emotional reactivity. Increased reactivity makes backlash feel more threatening. Backlash then increases responsibility to clarify. The loop accelerates. Patient 0 becomes not only the originator but also the emergency manager of the outbreak. Under such conditions, a functional collapse can be understood as an exhaustion event in a high-stakes feedback system.

4.4 Functional collapse without epistemic error: why "true" can still destabilize

A central theme of this paper is orthogonality: truth-value and effect profile are distinct. The Patient 0 phenomenon adds a further separation: epistemic correctness and personal stability are distinct. A person can be substantially right and still become unable to function under outbreak conditions.

This is important because modern discourse often treats psychological destabilization as evidence that the idea is false. That inference is not justified. Institutions can intervene because a person cannot sleep, eat, self-regulate, or remain safe, not because the person's claims have been formally refuted. Hospitalization is often a response to functional impairment and safety risk, not a verdict on truth.

Several structural mismatches explain why “true” can still destabilize.

The first is verification lag. Even if a claim is likely true, it may not be quickly provable in public. The originator may face relentless demands: “prove it now,” “summarize it instantly,” “defend it against hostile simplifications.” Those demands arrive on the impact clock, not the verification clock. The originator’s inability to satisfy immediate proof demands can be experienced as threat and humiliation, which increases arousal and destabilization.

The second is social threat amplification. Truth does not reduce hostility. In some environments, truth increases hostility because it threatens identities, institutions, or interests. Patient 0 may encounter intense opposition precisely because the idea is potent. The social consequences can arrive before any protective coalition forms.

The third is cognitive load from unbounded implications. Some ideas feel like keystones: if accepted, they force many other beliefs to shift. The originator may experience a cascading re-evaluation of reality. That cascade can be exhilarating and destabilizing simultaneously, especially under sleep loss.

The fourth is role entrapment. Once an idea spreads, the originator can be conscripted into a role: prophet, leader, villain, savior, threat, fraud. Those roles are imposed externally and reinforced by engagement. Patient 0 may be forced to live inside a narrative before they have chosen it. Role entrapment can produce acute distress independent of the idea’s truth.

The descriptive conclusion is straightforward: acute destabilization is not a reliable truth-test. It is a load outcome. Outbreak regimes increase the frequency of such outcomes by compressing feedback, moralizing response, and rewarding continuous engagement.

4.5 The first wave problem: early reactions before institutions can buffer

The first wave problem is that the earliest, fastest reactions occur before stabilizing institutions can do their work. In many domains, reliable evaluation requires time: peer review, investigative reporting, deliberative governance, legal due process, and community discussion. Outbreak regimes deliver consequences before these processes can respond.

In the first wave, the network supplies its own substitutes for evaluation. These substitutes are often high-speed and high-confidence: hot takes, quote-tweet distortions, moral sorting, and rapid coalition formation. The originator is exposed to these substitutes immediately. In effect, Patient 0 is judged in an environment that is not optimized for truth but for engagement.

Institutions can buffer, but they buffer late. Even supportive institutions move slowly compared to network cycles. A university, journal, newsroom, or professional community may take days or weeks to evaluate a claim responsibly. In that gap, the originator faces a storm without shelter. This is not merely uncomfortable. It changes behavior. Patient 0 may over-respond, under-sleep,

over-explain, retreat into isolation, or escalate rhetoric to maintain attention dominance. Each of these responses can worsen instability.

The first wave also produces irreversible narrative anchors. Early variants often dominate long-term perception because they are first. If the earliest public version is distorted, later corrections may fail to dislodge it. Patient 0 then experiences a specific form of helplessness: watching the package mutate publicly while lacking the authority or bandwidth to control it. That helplessness can amplify stress and accelerate collapse.

Finally, the first wave problem is a systemic amplifier. When Patient 0 visibly destabilizes, the event becomes part of the outbreak narrative. Opponents may cite it as discrediting evidence. Supporters may cite it as martyrdom. Both uses increase salience and spread. The individual episode becomes a signal that the network can weaponize, thereby coupling personal collapse to wider contagion dynamics.

Taken together, these features define Patient 0 as a new kind of epistemic risk locus: not the origin of falsehood, but the origin of a high-fitness package released into an unbuffered outbreak ecology. The sections that follow build outward from this point: how the package transmits, how variants evolve, how truth and impact diverge, and how individual destabilizations can accumulate into institutional stress and coordination failure without any need for a rogue autonomous system.

5. Transmission Mechanics: Medium and Infectiousness

Idea contagion becomes visible when an idea package leaves the incubation chamber and enters the network medium. At that point, the idea's fate is shaped less by its internal coherence and more by its transmission mechanics: where it travels, how it survives copying, who amplifies it, how it mutates, and how long it remains active. "Infectiousness" in this paper is not a moral term. It is the degree to which a package converts exposures into adoptions and adoptions into further exposures under low-friction replication and attention selection.

To study transmission mechanics is to study the interaction between a package and an environment. The same package can fail in one medium and explode in another. The same claim can remain inert in a professional community while going outbreak-level in a memetic subculture. The same call to action can recruit peaceful coordination in one cluster and harassment in another. The mechanics are therefore ecological: they depend on channel structure, community norms, and platform incentives.

This section maps five core components of idea transmission: channels and bridge nodes, portability under copying, super-spreaders and algorithmic amplification, variant formation and

fitness selection, and a minimal outbreak model that captures the dynamics without pretending to be epidemiology.

5.1 Channels: platforms, communities, social graphs, bridge nodes

The simplest mistake about online spread is to treat "the internet" as one place. In reality, the medium is a patchwork of channels—each with its own incentives, formats, and gatekeeping—and a patchwork of communities—each with its own priors and moral grammars. Idea contagion emerges when a package finds the right channel-community match and then crosses into adjacent clusters through bridge nodes.

Platforms are format engines. A short-video platform selects for visual immediacy, emotional punch, and rapid narrative closure. A micro-posting platform selects for slogans, hot takes, and conflict-ready fragments. A long-form platform selects for extended explanation, but only if it can be skimmed and excerpted. Messaging apps select for trust networks and rapid forwarding, often without public accountability. Each platform is therefore a selective environment that favors certain package shapes.

Communities are interpretation engines. The same phrase can mean different things in different subcultures. Communities carry priors about what counts as evidence, what counts as authority, what counts as moral seriousness, and what counts as betrayal. A package that aligns with those priors will face low adoption friction. A package that threatens them will face resistance, unless it arrives through a trusted source or a frame translation.

Social graphs determine the pathways of exposure. People do not encounter ideas randomly. They encounter them through friend networks, influencer followings, shared interest communities, and algorithmically constructed similarity clusters. Within clusters, repetition generates perceived consensus quickly. Between clusters, misunderstanding and hostility are common because frames do not transfer cleanly.

Bridge nodes are the key to outbreaks. A bridge node is an account, group, newsletter, forum, or aggregator that connects otherwise distinct clusters. Bridge nodes perform translation: they reframe a package so it becomes legible to a new audience. They also perform routing: they inject the package into a fresh network where it can ignite a new cascade. Some bridge nodes are individual people with multiple community memberships. Others are institutions. Others are cross-platform accounts that carry the same narrative across formats. In outbreak regimes, the crossing of a few bridges can matter more than the size of the original cluster.

A useful descriptive claim follows: contagiousness is often less about total audience size and more about cross-cluster mobility. An idea that remains trapped within one cluster may feel intense but stays local. An idea that crosses bridges becomes a multi-strain outbreak.

5.2 Portability: what survives copy-paste and paraphrase

A package's portability is its ability to survive replication with minimal loss of its core persuasive function. In the wild, most spread is not faithful copying. It is paraphrase, excerpt, screenshot, clip, and remix. Highly portable ideas are those whose "core" can survive distortion and still recruit adoption.

Several features increase portability.

Compression into tokens. The package contains a short handle that can be quoted without context. The token carries the frame. It is small enough to travel, yet rich enough to imply a worldview.

Self-contained moral sorting. The package tells the receiver what side they are on. It does not require additional knowledge to generate an emotional or identity response. This reduces friction because adoption can occur instantly.

Low dependence on technical detail. Technical claims can spread, but technical dependence reduces portability because paraphrase errors accumulate and because many audiences cannot evaluate specifics. Portable packages either avoid technical detail or convert it into a simple moral narrative.

High rhetorical "closure." The package gives a sense of completion: "now we understand," "the real cause is X," "everything makes sense," "the solution is obvious." Closure makes the receiver feel they possess the whole thing, which increases willingness to repeat it.

Resilience to counterargument. Portable packages often include preemptive defenses: "they will say this is misinformation," "they will try to silence you," "skeptics are paid," "experts are captured." Such defenses function as memetic antibodies. They increase portability by allowing the package to survive hostile environments without immediate collapse.

Portability is not necessarily deceit. A protocol for safe behavior can be portable and beneficial. A reconciliation frame can be portable and beneficial. The point is that portability is a structural property that predicts spread. In outbreak regimes, the most portable versions often dominate, even if they are less accurate than more nuanced formulations.

Portability also explains why Patient 0 loses control of the idea quickly. The package is designed to travel without the author. Once released, it can be carried by thousands of mouths, each slightly changing it, each spreading a variant. The author's original reasoning chain cannot travel at the same speed. The token travels faster than the explanation.

5.3 Super-spreaders: influencers, aggregators, recommender systems

Infectiousness is not only a property of the package. It is also a property of the distribution architecture. Outbreak dynamics often depend on super-spreaders: nodes that generate disproportionate secondary exposures.

Influencers are obvious super-spreaders. They can inject a package into a large audience and attach credibility by association. The influencer's endorsement functions as a shortcut: followers adopt not only because of content but because of trust, identity alignment, or parasocial loyalty. Even negative influencer attention can act as amplification, especially when followers are primed for conflict.

Aggregators are less glamorous but often more decisive. Newsletters, meme pages, topical accounts, and clip channels repackage content into digestible formats and route it across multiple clusters. Aggregators also serve as bridge nodes: they translate content across subcultures, strip nuance, and heighten emotional salience for maximum engagement. In outbreak terms, aggregators can be the difference between local diffusion and cross-platform ignition.

Recommender systems are the deep super-spreaders. They determine what millions see. Their selection criteria—engagement, watch time, sharing probability—function as fitness functions in an evolutionary ecology. A package that triggers strong reaction is rewarded with exposure, which increases reactions, which increases exposure. This feedback loop can generate rapid cascades even when no human super-spreader intends it.

Algorithmic super-spreading has two features that matter for idea contagion. First, it can synchronize attention, producing wave-like surges where many people encounter the package in the same time window. Synchronization accelerates perceived consensus and identity sorting. Second, it can amplify extremes, because extreme variants often produce stronger engagement. Over time, this can select for the most polarizing strain as the dominant public version, even if a milder strain existed at release.

Super-spreaders therefore act like accelerants. They do not create the package, but they can determine whether it becomes an outbreak. In the centaur era, the interaction between pre-optimized packaging and super-spreading distribution becomes especially potent: high-fitness packages arrive already shaped for the algorithmic environment.

5.4 Variant formation: remixing, distortion, fitness under attention

Once a package begins to spread, it rarely remains stable. It becomes a variant family: many related strains competing for dominance. Variant formation is a central feature of idea contagion because it explains why outbreaks can intensify and why debates become confused.

Variants emerge through remixing. People add jokes, anger, religious language, scientific language, local politics, or personal anecdotes. They tailor the package to their audience priors. Tailoring increases adoption within the target cluster, but it also increases divergence across clusters.

Variants emerge through distortion. Some distortion is accidental: paraphrase errors, partial screenshots, misremembered details. Some distortion is strategic: opponents reframe the package to make it ridiculous or sinister; supporters simplify it to make it more shareable. In both cases, distortion changes the package's meaning while often preserving its emotional charge.

Variants also emerge through polarization selection. Outbreak ecologies often favor more extreme strains because they generate more engagement. Extreme strains provide stronger moral sorting and stronger calls to action. They may be less accurate, but they are fitter for attention. Over time, the public may associate the entire idea family with its most extreme strain, which then changes institutional response and increases conflict.

Fitness under attention is the key selection principle. A variant is "fit" if it recruits clicks, shares, outrage, fear, hope, or identity performance. Fitness is not the same as truth, and it is not the same as long-run benefit. It is short-run survival in a competitive attention ecosystem.

This produces an important systemic effect: outbreaks can evolve away from the originator's intent. Patient 0 may release a carefully bounded claim, but the variant family can drift toward stronger moral sorting, stronger enemies, and stronger urgency because those features increase replication. The originator may attempt to correct the drift, but correction is often less fit than escalation. The outbreak becomes an ecological phenomenon, not an authored essay.

Variant formation also creates strain warfare. Competing variants fight for dominance inside the same community. Some claim to represent the "true" version. Others accuse rivals of dilution or betrayal. This internal conflict can keep the outbreak alive by generating continuous content, even after the original claim would otherwise decay.

5.5 Minimal outbreak model: exposure, adoption thresholds, retention, half-life

To keep the contagion vocabulary disciplined, it helps to propose a minimal model—simple enough to be usable, rich enough to capture what matters, and modest enough not to pretend to biological precision.

A minimal outbreak model can be built from four variables.

Exposure is how often and how widely the package is encountered. Exposure depends on platform routing, super-spreaders, and cross-cluster bridges. Exposure is the fuel; without it, nothing spreads.

Adoption threshold is the friction required for a person to accept and/or repeat the package. Some packages have low thresholds because they align with priors, provide emotional closure, or offer identity rewards. Others have high thresholds because they require technical understanding or violate community norms. The lower the threshold, the more exposures convert to adopters.

Retention is how long the package remains “active” in the mind and behavior of the adopter. Retention is increased by identity binding, affective load, narrative closure, and repetition. High retention increases the probability of future shedding: the person will share again when triggered by events.

Half-life is the population-level decay time of attention and replication. Some outbreaks burn out quickly; others become enduring frames. Half-life is extended by periodic triggering events, ongoing conflict, and variant warfare. A package with a long half-life can shape institutions even if its initial spread was modest, because it becomes a background lens through which new events are interpreted.

These variables interact. High exposure plus low adoption thresholds produces rapid growth. High retention plus long half-life produces durable cultural influence. High mutation rates produce variant families that can exploit multiple subcultures and keep the outbreak alive. Importantly, none of these variables require falsity. A true coordination protocol can have high exposure and low adoption friction. A false scapegoating frame can also have those properties. The model is content-agnostic; it describes propagation dynamics.

This minimal model also helps explain why Patient 0 is uniquely vulnerable. At release, Patient 0 experiences immediate exposure to feedback, a rapidly changing adoption environment, and high retention because of authorship ownership. The originator is not just a transmitter; they are also the first person living inside the half-life dynamics of the outbreak they initiated. In many cases, they are pulled into continuous engagement precisely because the outbreak is still forming and because early variants are being selected before any stabilizing institution can slow the system down.

With these mechanics established, the next step is to connect transmission dynamics to the deeper orthogonality problem: truth-value and effect profile. Outbreak regimes make it easy for coherence and plausibility to be mistaken for evidence, and for rapid adoption to be mistaken for verification. The following section develops the two-axis framework that prevents those confusions and explains why “likely true” ideas can still produce harmful or destabilizing effects when their outbreak form recruits the wrong behaviors.

6. Psychology of Adoption Without Pathologizing

To explain idea contagion, it is not enough to describe networks and algorithms. Ideas spread through minds. The psychological layer is where exposure becomes adoption, where a token becomes a lens, and where a call to action becomes behavior. The difficulty is that contemporary debate often treats the psychology of adoption as either stupidity ("people are gullible") or illness ("they're delusional"). Both framings are lazy and usually false. Idea contagion is better understood as ordinary cognitive and social mechanisms operating under unusual speed, unusual scale, and unusual incentive gradients.

In outbreak regimes, minds are not broken; they are recruited. A contagious package succeeds when it reduces cognitive friction, provides emotional resolution, and offers identity rewards that outweigh social costs. The same mechanisms can support prosocial norms (coordination, restraint) or antisocial spirals (scapegoating, humiliation, zero-sum frames). The difference is not that one group has "healthy minds" and the other has "sick minds." The difference is what the package offers, how it matches priors, and what the surrounding ecology rewards.

This section describes five psychological mechanisms that increase adoption probability without presuming pathology: salience and closure, identity binding, affective load, repetition and reinforcement, and susceptibility as a spectrum across experience levels.

6.1 Salience and closure: why some ideas feel inevitability-shaped

Salience is the felt importance of an idea: the sense that it matters now, reorganizes priorities, and changes how events should be interpreted. Closure is the feeling of completion: "this explains it," "this resolves the confusion," "this tells me what to do." Together, salience and closure are among the strongest drivers of adoption because they convert uncertainty into orientation.

Many contagious ideas feel inevitability-shaped. They do not present themselves as one hypothesis among many; they feel like the missing key that makes everything snap into place. Several features create this effect.

Explanatory compression creates inevitability. When a complex world is reduced to a simple causal story, the simplicity itself can feel like truth. The mind experiences relief: fewer moving parts, fewer ambiguities, fewer competing narratives. Relief is not evidence, but it is persuasive.

Pattern capture creates inevitability. If a frame can connect many disparate events under one lens, it generates the sense of a hidden order. Humans are pattern-seeking creatures; we are built to notice structure. In outbreak regimes, pattern capture can be accelerated by rapid examples and curated anecdotes that make the frame feel universally applicable.

Urgency creates inevitability. A contagious package often implies that delay is dangerous and that action is required now. Urgency converts the idea into a threshold event: "if you see this

and do nothing, you are complicit." This reduces the space for slow verification and increases adoption pressure.

Moral clarity creates inevitability. When an idea sorts the world cleanly into right and wrong, it offers a form of closure that is not intellectual but ethical. Ethical closure can be deeply stabilizing internally, even when the external world remains complex. It is also highly transmissible.

In centaur contexts, these effects can be intensified because a package can be tuned for maximal clarity and minimal ambiguity. The result is not necessarily deception. It is a shift in the felt texture of ideas: they arrive "finished," and finished ideas feel inevitable.

6.2 Identity binding: belonging, status, moral signaling, social costs

Identity binding is the process by which adopting an idea becomes part of who someone is, not merely what someone thinks. In outbreak regimes, identity binding is a primary accelerant because it turns replication into belonging and defense into loyalty.

Belonging is the most basic mechanism. A contagious frame often comes with a community: those who "get it." Adoption provides entry into a social world. In fragmented public spheres, that entry can feel like refuge: shared language, shared enemies, shared mission.

Status is the next mechanism. Some ideas offer epistemic status: the adopter feels smarter, more awake, more discerning, less manipulated. Others offer moral status: the adopter feels righteous, compassionate, brave, or pure. Status rewards increase sharing because posting becomes a performance of rank.

Moral signaling binds identity tightly because it makes disagreement costly. If adopting the idea signals goodness, then rejecting it signals coldness or complicity. This converts intellectual debate into moral sorting. In outbreak regimes, moral signaling can be both prosocial and antisocial: it can spread norms of restraint and care, or it can spread humiliation and purification rituals.

Social costs are the lock-in. Once someone publicly endorses a package, reversing course can be humiliating. The cost is not only internal pride; it is external reputation. The person must explain themselves to their group, and groups often punish defection. This creates persistence: people keep repeating and defending a package because the price of correction is too high.

Identity binding is not irrational. Humans are social creatures. Our beliefs are not private possessions; they are part of relational life. Outbreak regimes exploit this fact structurally: packages that fuse belief with belonging are fitter for spread than packages that remain abstract and lonely.

6.3 Affective load: fear, hope, outrage, awe, motivational energy

Affective load is the emotional energy carried by an idea package. In contagion terms, affect is a transmission fuel because emotion increases attention, memory, and action.

Fear is an especially strong fuel. Fear narrows attention, increases urgency, and prioritizes rapid sharing as a protective act: warn others, mobilize, defend. Fear-based packages can produce fast cascades because they convert the receiver into a broadcaster.

Hope is a different fuel. Hope spreads when it offers possibility and agency: a way forward, a plan, a redemption arc. Hope-driven contagions can be prosocial—mobilizing reconciliation or constructive coordination—or they can become harmful if they are attached to false certainty or scapegoating fantasies. The key feature is that hope sustains engagement over time, extending half-life.

Outrage is the classic fuel of attention ecosystems. It offers immediate moral clarity, identifies an enemy, and supplies an action: shame, punish, exclude, fight. Outrage is highly transmissible because it is performable. People can join the outrage without deep understanding, which lowers adoption thresholds.

Awe is often underestimated. Awe-based packages spread by creating the feeling of standing near something vast: cosmic meaning, hidden truth, revolutionary breakthrough. Awe can be constructive when it motivates humility and curiosity. It can be destabilizing when it generates grandiosity or overwhelms the person's capacity to integrate implications. In Patient 0 events, awe can be a key ingredient of meaning shock: the originator feels they have touched something world-shaping.

Affective load does not make an idea false. It makes it sticky. It also changes behavior: high affect increases the probability of immediate sharing and decreases the probability of slow verification. In outbreak regimes, affect is selected for because it performs well under engagement incentives. This selection pressure explains why the dominant public strain of an idea family often carries more emotional charge than the originator's initial formulation.

6.4 Repetition and reinforcement: familiarity, perceived consensus, lock-in

Repetition is the quiet engine of contagion. Once a package is repeated across multiple channels, it gains familiarity. Familiarity is often misread as truth. Even when people know they should not equate repetition with evidence, the felt sense of plausibility increases with exposure.

Perceived consensus emerges when the same token appears from many sources, even if those sources are downstream copies of the same original. In network environments, repeated exposure creates the impression that "everyone is talking about it," which can be interpreted as "it must be real." This is not stupidity. It is a social heuristic: in ordinary life, many independent

endorsements do correlate with reliability. Outbreak regimes break that heuristic by making copying too easy and independence too rare.

Reinforcement also occurs through micro-rewards. Each like, retweet, supportive comment, or in-group affirmation acts as a small reinforcement signal. Over time, people learn which frames earn approval and which earn punishment. This shapes what they believe they can say, and eventually what they feel.

Lock-in is the final stage. Once someone has repeated a package publicly and received reinforcement, the package becomes part of their public identity. Correcting becomes costly. Doubt becomes privately suppressed. This does not require authoritarian control; it can emerge from ordinary social dynamics.

Repetition also fuels variant stabilization. Early in an outbreak, many variants compete. The ones that are repeated most become the "official" public version, even if they are less accurate. Once stabilized, the dominant strain becomes the target of institutional response and the anchor for public debate. This is one reason why early waves are so consequential: repetition selects the version that society will later argue about.

6.5 Susceptibility as spectrum: novice vs expert reception dynamics

In idea contagion, "susceptibility" is not a simple trait like gullibility. It is a spectrum shaped by experience, context, and role. Novices and experts can both be vulnerable, but in different ways.

Novices often have lower verification capacity. They may lack domain knowledge to evaluate claims, which increases reliance on surface cues: confidence, polish, citations-as-aesthetic, and social proof. Novices may also experience rapid worldview reorganization when exposed to a high-closure frame because they have fewer established priors. The package can become a primary lens quickly.

Experts have different vulnerabilities. They can be seduced by coherence that aligns with their existing models. They may overestimate their immunity to persuasion, assuming that intelligence equals protection. Experts may also be drawn into identity dynamics: defending their status, attacking rivals, or aligning with a faction that validates their expertise. In outbreak regimes, experts can become super-spreaders because their endorsement carries authority, even when they are outside their true competence domain.

There is also a role-based susceptibility. People under high stress, sleep loss, isolation, or public scrutiny have reduced buffer capacity. Patient 0 is susceptible not because of ignorance but because of role load: maximum salience, maximum agency, maximum feedback.

Finally, there is interpretive susceptibility: the degree to which a person treats a frame as totalizing. Some people can adopt an idea provisionally, keeping it bounded. Others experience it as identity-defining. Totalizing adoption increases both shedding and conflict, because everything becomes evidence and every disagreement becomes betrayal.

Understanding susceptibility as spectrum keeps the framework humane and accurate. Outbreak regimes recruit ordinary psychology. They do not require mass stupidity. They do not require mass illness. They require only a medium that makes copying easy and selection intense, plus packages that offer closure, belonging, emotion, and performable identity. In that environment, adoption becomes less about careful evaluation and more about survival inside a social ecosystem.

With the psychological mechanisms in view, the next section returns to the orthogonality problem in sharper form: truth-value and effect profile. The psychology of adoption explains why plausibility and coherence can outrun evidence, and why high-affect, high-closure packages can produce large behavioral effects whether they are true, false, or still unknown.

7. Truth-Value and Effect Profile as Orthogonal Axes

In outbreak regimes, a familiar moral reflex becomes unreliable: people assume that if an idea is true, it is therefore good to spread; if it is false, it is therefore bad to spread. That reflex collapses two dimensions into one. The centaur epistemic climate makes the collapse costly because transmission is fast, effects are immediate, and verification is often slow. A usable vocabulary needs a clean separation between what an idea *is* in relation to reality and what an idea *does* in relation to human behavior and institutions.

This paper therefore treats truth-value and effect profile as orthogonal axes. Truth-value concerns whether a claim corresponds to reality. Effect profile concerns what happens when the idea spreads: how it changes perception, behavior, coordination, trust, and institutional functioning. These axes can correlate, but they do not coincide. A true claim can produce destructive behavior. A false claim can produce benign or even constructive behavior. An unknown claim can produce explosive synchronization long before it is resolved.

The practical value of this framework is that it prevents two common errors. The first error is epistemic naïveté: treating viral plausibility as proof. The second error is moral naïveté: treating truth as automatic permission to spread without regard for consequences. In the centaur era, both errors are amplified because packages are optimized for persuasion and networks reward early dominance. Orthogonality keeps analysis disciplined under speed.

7.1 True-but-harmful, false-but-benign, unknown-and-explosive

Consider three illustrative categories that become common in outbreak conditions.

True-but-harmful refers to ideas whose core claim is substantially accurate but whose spread produces harmful outcomes. There are multiple pathways. A true claim can be weaponized as a scapegoating tool: the fact is real, but the moral inference becomes dehumanizing. A true claim can trigger panic or violent mobilization because it arrives without proportional framing or without workable action channels. A true claim can destabilize institutions prematurely: a real risk is interpreted as immediate apocalypse, producing destructive overreaction. A true claim can also erode trust if it is delivered in a humiliating, contemptuous style that provokes identity backlash and polarization. In these cases, the harm arises not from falsity but from outbreak form: framing, urgency, enemy construction, and call to action.

False-but-benign refers to ideas that are not strictly true yet produce limited harm or even some benefit. Placebo-like effects exist in social life: belief in a harmless practice can increase hope, reduce anxiety, or support community bonding. A symbolic narrative can produce prosocial behavior even if its factual basis is shaky. This category is not an endorsement of falsity; it is an acknowledgment that effect profile is not always proportional to epistemic quality. In outbreak regimes, people often argue as if falsity automatically implies catastrophic harm. Sometimes it does. Sometimes it does not. The category exists to preserve descriptive accuracy.

Unknown-and-explosive refers to ideas whose truth-value is not settled at the time of spread, yet whose outbreak behavior produces large real-world consequences. This is arguably the signature condition of the centaur era. Many claims that matter are complex, technical, or entangled with incomplete data. They cannot be verified instantly. Yet they can still ignite cascades because the package offers closure, identity alignment, and urgent action. Unknown-and-explosive ideas are especially dangerous because they can lock in policy, reputations, and social divisions before the evidential picture stabilizes. Even if later evidence supports the claim, the initial outbreak may have already produced irreversible harms through overreaction, scapegoating, or institutional destabilization. Even if later evidence refutes the claim, the outbreak may persist because identity binding and repetition have replaced evidence as the stabilizing force.

These categories show why moral and epistemic arguments often talk past each other. One side argues about truth. The other argues about consequences. Orthogonality allows both to be addressed without confusion.

7.2 Time-to-verification vs time-to-impact

The most important structural mismatch in outbreak regimes is the difference between two clocks.

Time-to-verification is the time required to responsibly evaluate a claim. In some domains, it is short: a video can be authenticated, a quote can be checked, a statistic can be located. In other domains, it is long: biomedical effects, geopolitical motives, complex causal systems, long-range social predictions, and technical scientific disputes. Verification also depends on institutions: peer review, investigative reporting, replication, legal process, and expert consensus formation. These processes are slow for good reasons: they are designed to reduce error.

Time-to-impact is the time required for the idea to produce effects once released. In network environments, time-to-impact is often extremely short. Within minutes or hours, a package can reorganize discourse, trigger harassment, mobilize protests, crash reputations, prompt institutional statements, alter investor behavior, or provoke policy demands. Time-to-impact can also be personal: sleep disruption, panic, identity conflict, and acute stress responses can occur immediately in Patient 0 and early adopters.

When time-to-impact is shorter than time-to-verification, society experiences a governance problem: decisions, reactions, and conflicts occur under uncertainty. In older eras, slower dissemination allowed verification to catch up before effects became irreversible. In the centaur era, the order often reverses: effects precede verdicts.

This mismatch is not solved by shouting “wait for evidence,” because the system’s incentives and the psychology of adoption reward immediate response. Nor is it solved by suppressing all uncertain ideas, because uncertainty is the normal condition of real inquiry. The mismatch is a structural feature that must be named if it is to be managed. Orthogonality turns the mismatch into a measurable description: an outbreak can be high-impact even when truth-value is unsettled.

7.3 Why plausibility is not truth, and coherence is not evidence

Outbreak regimes exploit a cognitive shortcut that is ordinarily useful: coherent explanations often are more likely to be true than incoherent ones. The problem is that coherence can now be manufactured quickly and at scale. In the centaur incubation chamber, a package can be polished into high plausibility with strong narrative structure, clean moral grammar, and preemptive answers to objections. The resulting output feels “obvious.” Obviousness is not evidence.

Plausibility is a judgment about fit with priors. It asks, “does this sound like it could be true?” That depends heavily on what the listener already believes, what metaphors resonate, what authorities they trust, and what causal stories feel familiar. In polarized environments,

plausibility can become factional: each group has its own plausibility landscape. A claim can be maximally plausible inside one community and absurd inside another.

Coherence is a property of internal consistency: the story hangs together. Coherence can be achieved through selective omission, emotional framing, and rhetorical closure. A coherent story can still be wrong if its premises are wrong, its evidence is cherry-picked, or its causal leaps are unsupported. In outbreak regimes, coherence is selected for because it increases shareability and reduces cognitive friction. That selection can produce an ecology in which the most coherent packages dominate attention, regardless of truth.

Evidence is different. Evidence is tethering: data, traceable sources, replicable observations, falsifiable predictions, and procedures that can be audited. Evidence is slower and often less satisfying than coherent narrative. Evidence also requires trust in institutions and methods. In the centaur era, the gap between coherence and evidence becomes a key failure mode: packages that feel like evidence can travel as if they were evidence, because the aesthetic of proof is easier to generate than proof itself.

The practical implication is not cynicism. It is calibration. Outbreak regimes require a new literacy: the ability to separate rhetorical completion from evidential completion. Orthogonality provides the conceptual space to do that without denying that coherent narratives can sometimes be correct.

7.4 Early certainty as a spread advantage and a verification hazard

Finally, outbreak mechanics reward early certainty. A package that speaks with confidence travels faster than a package that hedges. Certainty lowers adoption thresholds by reducing ambiguity. It increases identity binding by presenting the frame as a moral test. It increases urgency by implying that delay is complicity. In attention ecosystems, certainty is also more engaging: conflict requires firm positions.

This creates a structural hazard: early certainty often arrives before verification. The most contagious version of an idea is therefore often the least epistemically disciplined version. It may omit caveats, boundary conditions, and uncertainty ranges—precisely the features that responsible verification requires. The package becomes a high-fitness strain by sacrificing nuance.

Early certainty also creates lock-in. Once many people have publicly adopted a certain frame, later evidence has trouble changing minds because the issue has become identity-bound. Corrections are treated as attacks, not updates. Institutions attempting to introduce nuance are accused of cover-up or capture. This is how unknown claims become socially “true” long before they are epistemically settled: the frame becomes a tribal badge.

For Patient 0, early certainty can be doubly hazardous. The originator may feel pressure to speak with certainty to maintain narrative dominance, especially under attack. That pressure can accelerate exhaustion and destabilization, because the originator must defend a fixed position in a rapidly mutating environment. Alternatively, if Patient 0 attempts to speak with nuance and humility, they may lose the spread contest to more certain variants produced by others. In either case, the outbreak ecology rewards the appearance of certainty and punishes the slow pace of evidence.

The conclusion of this section is not that certainty is always wrong. Some things are genuinely well-supported. The conclusion is that outbreak regimes make certainty a fitness trait, independent of whether it is warranted. Orthogonality keeps that distinction visible: a package can be highly contagious because it is confident, while its truth-value remains uncertain; it can be true and still produce harm because certainty drives overreaction; it can be false and still produce benign effects because it recruits hope without violence. The next step is to classify outbreak archetypes by action structure—how different packages recruit different behaviors—and then to trace the path from individual destabilization to systemic risk when multiple outbreaks compete in the same cultural ecology.

8. Outbreak Archetypes and Their Action Structures

If idea contagion is a regime, then outbreaks are not all the same. What matters is not only how fast a package spreads, but what the package *does* once adopted—what behaviors it recruits, what identities it binds, what institutions it pressures, and what kinds of coordination it makes possible or impossible. In biological metaphors, this is the difference between an infection that is mostly asymptomatic, one that causes mild illness, and one that attacks critical systems. In epistemic terms, this is the difference between a contagious protocol that stabilizes cooperation and a contagious frame that escalates conflict.

This section classifies outbreak archetypes by action structure: the characteristic pattern of actions and social dynamics that the package induces when it becomes widespread. The point is not to moralize, but to describe recurring forms. In outbreak regimes, these archetypes can appear regardless of truth-value. A true claim can attach to an antisocial action structure. A false claim can attach to a prosocial action structure. The decisive variable is often the package's frame and call to action: who is blamed, what is demanded, how urgency is defined, and what counts as acceptable response.

Four archetypes are especially useful: prosocial contagions, antisocial contagions, ambivalent contagions, and mixed ecologies where multiple outbreaks compete and interact.

8.1 Prosocial contagions: coordination protocols and nonviolent norms

Prosocial contagions are outbreaks whose dominant action structure increases cooperative capacity. They do not merely spread beliefs; they spread *methods* and *norms* that enable groups to coordinate with lower friction and lower violence. Prosocial contagions can be moral, procedural, or practical.

Coordination protocols are one form. These are simple, portable rules that people can enact together: how to resolve disputes, how to verify claims before sharing, how to allocate resources fairly, how to reduce harm during conflict, how to negotiate without escalation. When such protocols are contagious, they raise the baseline competence of communities. They reduce the probability that disagreement becomes warfare.

Nonviolent norms are another form. These outbreaks spread constraints: “do not dehumanize,” “do not retaliate,” “do not punish by mob,” “seek reconciliation,” “protect the vulnerable,” “slow down under uncertainty.” Their action structure often includes a refusal of humiliation as a tool, an emphasis on repair over revenge, and a preference for institutional procedures over vigilantism. These norms are not always popular because they can feel like weakness in conflict environments. But when they become contagious, they act as stabilizers: they limit the damage of other outbreaks.

Prosocial contagions often carry distinctive frames. They present opponents as humans rather than enemies, emphasize shared fate rather than zero-sum outcomes, and substitute procedural legitimacy for moral grandstanding. They also often include a key element that makes them fit for spread: they give people agency without giving them a target to punish. They offer something to *do*—listen, verify, coordinate, repair—without supplying an out-group to hate.

Their vulnerability is that they can be outcompeted in attention markets. Outrage and scapegoating are often more engaging than restraint and repair. For prosocial contagions to survive, they often require credible carriers, repeated practice, and institutional reinforcement. But when they do spread, they are among the most valuable forms of contagious ideas because they increase the capacity of a society to endure uncertainty without tearing itself apart.

8.2 Antisocial contagions: scapegoating, humiliation loops, zero-sum frames

Antisocial contagions are outbreaks whose action structure reduces cooperative capacity and increases conflict. They spread by converting uncertainty into a target and by turning disagreement into moral warfare.

Scapegoating is a core mechanism. The package identifies a group or person as the cause of complex problems and frames punishment as both necessary and virtuous. Scapegoating offers closure: someone is to blame. It also offers an action: exclude, attack, shame, remove. In

outbreak regimes, scapegoating spreads quickly because it supplies both moral clarity and group cohesion. It can attach to true grievances or false accusations; the action structure remains dangerous because it substitutes blame for understanding and punishment for repair.

Humiliation loops are a related mechanism. The package recruits public shaming as a method of enforcement. People are rewarded for performing moral superiority and for escalating condemnation. The loop persists because shaming generates engagement, engagement generates visibility, and visibility generates more shaming. Humiliation loops can consume institutions: leaders become afraid to speak, procedural fairness collapses, and the public sphere becomes an arena for punishment rather than deliberation.

Zero-sum frames make conflict inevitable. They present social life as a battle where one side must win and the other must lose. They interpret compromise as betrayal. They treat moderation as weakness. When such frames become contagious, coordination across groups collapses because shared reality and shared procedures are replaced by tribal loyalty. Zero-sum frames are especially dangerous in outbreak ecologies because they can attach to almost any issue. Once the frame is installed, every event becomes evidence of enemy intent.

Antisocial contagions often have high fitness under attention selection because they generate strong emotion and clear identity sorting. They also produce rapid adoption because they do not require technical understanding; they require only moral alignment. Their long-run effect is institutional stress, increased polarization, and a reduction in the public's capacity to solve complex problems that require cooperation.

In the Patient 0 context, antisocial contagions are also more likely to create acute destabilization, because the originator can become the target of humiliation loops and threats. The network's first wave may conscript the originator into villain or hero roles, and antisocial dynamics tend to punish nuance. This increases load and increases the likelihood that a personal episode becomes part of the outbreak narrative.

8.3 Ambivalent contagions: destabilizing truths and necessary shocks

Not all outbreaks can be cleanly categorized as beneficial or harmful. Some contagious ideas produce disruption that is morally mixed. These are ambivalent contagions: outbreaks whose action structure is destabilizing but may be necessary to correct long-term lies, corrupt institutions, or stalled moral progress.

Destabilizing truths are a primary example. Sometimes a true claim reveals wrongdoing, systemic failure, or hidden harm. Its spread can trigger panic, anger, and institutional crisis. Those effects are harmful in the short run, but the disclosure may be necessary for repair. The action structure is disruptive because it forces reorganization: resignations, reforms, legal

actions, and changes in trust relations. In these cases, the same outbreak can produce both destructive and constructive outcomes depending on how communities respond.

Necessary shocks are another example. Some ideas function as shocks that break complacency: they force attention to neglected realities. They may trigger moral anger and conflict, but they can also mobilize reform. The difficulty is that shock-driven contagions can be hijacked. Outrage can be redirected into scapegoating. Reform energy can be converted into purification campaigns. In outbreak regimes, the first wave often determines which direction the shock goes, because early variants set the moral grammar.

Ambivalent contagions therefore highlight why orthogonality matters. The question is not merely “is it true?” or “is it viral?” The question is what action structure dominates: does the outbreak recruit procedural reform and nonviolent pressure, or does it recruit humiliation loops and retaliatory violence? Two communities can be exposed to the same destabilizing truth and respond with radically different action structures based on their norms and leaders.

In centaur contexts, ambivalent contagions are especially likely because centaur co-creation can surface neglected patterns and articulate them with compelling clarity. That clarity can be valuable. It can also arrive without the institutional scaffolding needed to integrate the truth without overreaction. Patient 0 risk increases precisely in these cases: the originator may experience meaning shock and responsibility shock because the idea feels both necessary and dangerous to release.

8.4 Mixed ecology: multiple outbreaks competing, fusing, and polarizing

The most realistic condition is not one outbreak at a time. It is a mixed ecology: many contagious packages circulating simultaneously, competing for attention, fusing into hybrids, and polarizing communities through mutually reinforcing frames.

Competition is the baseline. Attention is scarce. Outbreaks that generate stronger emotion, clearer identity sorting, and faster closure tend to outcompete those that demand patience or nuance. This competition can distort the public sphere by selecting for high-engagement strains rather than high-truth or high-cooperation strains.

Fusion occurs when packages borrow elements from each other. A technical claim can be fused with a moral enemy frame. A prosocial protocol can be fused with a tribal loyalty test. A destabilizing truth can be fused with a purification campaign. Fusion creates hybrid strains that can spread across more audiences by offering both explanation and moral sorting, both agency and an enemy. Hybrid strains are often highly fit because they combine cognitive closure with emotional fuel.

Polarization arises when outbreaks form antagonistic pairs. One frame defines itself against another. Each side treats the other as evidence of corruption. The public sphere becomes a

battlefield of competing outbreak families, each with its own vocabulary and reality lens. In such environments, even neutral institutions are forced to choose a frame, and the act of choosing is interpreted as betrayal by the other side.

Mixed ecologies also produce turbulence through cascade interactions. One outbreak can trigger another. A scapegoating outbreak can provoke a counter-outbreak of defensive solidarity. A disclosure outbreak can provoke a denial outbreak. A reconciliation outbreak can provoke an outrage outbreak accusing it of weakness. These interactions can keep the system in a chronic outbreak state, where attention never settles and institutions never recover.

For Patient 0, mixed ecology conditions are particularly hazardous. The originator may release a bounded package, but within hours it is absorbed into competing outbreaks. Opposing camps may weaponize it. Supporters may radicalize it. Critics may distort it. The originator becomes a contested symbol inside a multi-outbreak environment, and that symbolic role can amplify stress and destabilization.

The broader implication is that civilization breakdown does not require a single catastrophic falsehood or a single malevolent actor. A mixed outbreak ecology can degrade shared reality, erode procedural legitimacy, and reduce coordination capacity through chronic polarization and repeated stress waves. The next section therefore turns from archetypes to system dynamics: how individual events and local outbreaks accumulate into institutional strain, reality fragmentation, and coordination failure, producing breakdown pathways that look nothing like paperclip apocalypse and everything like a society that can no longer agree on what is real or what is permissible.

9. From Individual Episodes to Systemic Risk

The Patient 0 episode is the smallest visible unit of a larger dynamic: a person destabilizes under outbreak conditions. But idea contagion becomes a civilizational problem only when these individual-level events couple into population-level behavior and institutional stress. The core claim of this section is that systemic risk can emerge without any autonomous machine takeover. It can emerge from the interaction of three ordinary forces operating at new speed and scale: contagious packages, attention-optimized distribution, and human coordination limits under uncertainty.

In this view, “breakdown” is not a single apocalyptic event. It is a degradation of shared reality, shared procedure, and shared restraint. It is the loss of the ability to disagree without escalating, to verify without humiliating, and to decide without treating every decision as betrayal. Individual destabilizations—whether they involve panic, exhaustion, withdrawal, or public collapse—matter because they become signals in the outbreak ecology. Signals recruit

interpretation. Interpretation recruits action. Action recruits counter-action. This is how micro events become macro forces.

This section explains five coupling mechanisms: the transformation of individual episodes into social signals, the fragmentation of reality frames, the lag of institutions relative to virality, the resulting coordination failures, and the "turbulence ratchet" by which repeated outbreaks weaken norms over time.

9.1 Micro-to-macro coupling: how individual destabilization becomes social signal

In outbreak regimes, individuals are not only people; they become symbols. When someone visibly destabilizes, the event rarely stays personal. It becomes content, and content becomes a signal that competing frames interpret.

The coupling begins with visibility. A public breakdown, a hospitalization, a frantic thread, a sudden disappearance, an emotional video—these are all high-engagement artifacts. They are portable, emotionally charged, and narrative-rich. They travel well. The episode becomes part of the outbreak itself, even if it began as an internal human limit.

Visibility then invites framing. Supporters interpret the episode as martyrdom, persecution, proof of the idea's power, or evidence that the system is retaliating. Opponents interpret it as incompetence, insanity, guilt, fraud, or proof that the idea is dangerous. Both framings serve the needs of their respective outbreaks because they supply moral clarity and justify action.

Once framed, the episode recruits alignment behavior. People share not to inform but to signal: "this is what I believe," "this is who I am," "this is who we are fighting." The person becomes an emblem, and emblems accelerate polarization because they simplify complex debates into loyalty tests.

Finally, micro episodes can trigger institutional responses. Employers, platforms, professional associations, and governments may respond under pressure—issuing statements, suspending accounts, launching investigations, calling for regulation, or refusing to engage. Each response becomes additional signal material, which can amplify the outbreak. The system enters a self-reinforcing loop: human distress becomes content, content becomes tribal proof, proof demands action, action creates more content.

Micro-to-macro coupling therefore depends on one key property of outbreak regimes: personal events are not private for long. They are instantly convertible into transmissible tokens that power larger narratives.

9.2 Reality fragmentation: incompatible frames and procedural collapse

Systemic risk accelerates when society loses not only agreement on facts, but agreement on how facts should be determined. Reality fragmentation occurs when communities adopt

incompatible frames that define different standards of evidence, different authorities, and different procedures for adjudication.

In fragmented environments, two people can encounter the same event and not merely disagree about interpretation—they can disagree about what counts as a valid question. One frame treats institutions as legitimate. Another treats them as captured. One frame treats uncertainty as normal. Another treats uncertainty as proof of deception. One frame treats verification as a slow method. Another treats delay as cover-up. These are not disagreements about a single claim; they are disagreements about epistemic procedure.

Procedural collapse follows when shared methods lose legitimacy. Journalism, peer review, courts, elections, and professional standards function only when enough people accept their outputs as binding even when inconvenient. Outbreak regimes weaken this acceptance by supplying alternative procedures that are faster and more identity-confirming: crowdsourced certainty, influencer verdicts, and meme trials. These alternatives feel immediate and morally satisfying, but they do not scale to complex truth.

Fragmentation also produces frame-internal "evidence." Within a community, repetition, consensus cues, and emotionally resonant anecdotes become proof. External criticism is discounted as enemy speech. This creates closed loops: each frame becomes self-sealing, interpreting challenges as confirmation of hostility.

The result is a society that cannot converge on shared descriptions of reality, and therefore cannot coordinate on policy, resource allocation, or restraint. Even when people want peace, they lack the shared procedural substrate needed to build it. This is one pathway to breakdown that has nothing to do with autonomous machines and everything to do with incompatible human world-models under attention selection.

9.3 Institutional lag: downstream validation under upstream virality

Institutions are designed for accuracy and legitimacy, not speed. Outbreak regimes punish that design. When virality is upstream—happening before institutional digestion—institutions are forced into reactive mode.

Lag has several consequences.

First, it creates a vacuum that the network fills. While institutions investigate, the outbreak supplies its own answers. Those answers become entrenched. Later institutional findings, even if correct, may arrive too late to dislodge the dominant frame.

Second, lag produces reputational asymmetry. Institutions that say "we don't know yet" appear weak, captured, or evasive to audiences conditioned for certainty. The outbreak rewards

confident claims and punishes careful ones. This pressures institutions to speak prematurely, which increases error rates and further erodes trust.

Third, lag invites politicization. If institutional outputs are slow, actors can claim that slowness is deliberate suppression. If institutional outputs contradict a popular frame, the institution is accused of corruption. Either way, the institution becomes part of the outbreak content stream rather than a stabilizing external referee.

Fourth, lag increases the burden on individuals. Patient 0 and early adopters often become de facto interpreters because institutional interpreters are late. This amplifies personal load, increases the probability of destabilization, and increases the likelihood that the outbreak's early variants are selected for emotional fitness rather than evidential grounding.

Institutional lag is therefore not simply an inconvenience. It is a structural vulnerability in outbreak regimes: the system's stabilizers operate on slower timescales than the system's accelerants.

9.4 Coordination failure: why breakdown can occur without rogue autonomy

"Rogue AI" narratives often assume that breakdown requires machine agency: a system escapes control and imposes an alien goal. The contagion framework offers a different pathway: breakdown can occur through human coordination failure in an environment saturated with contagious packages.

Coordination failure occurs when groups cannot align on shared goals, shared facts, or shared procedures. In outbreak regimes, coordination fails through several mechanisms.

Information overload reduces collective attention. When many outbreaks compete, people cannot track issues, evidence, or nuance. They retreat into simpler frames and tribal heuristics. Complexity becomes intolerable. This favors polarizing packages and weakens deliberation.

Trust collapse reduces cooperative capacity. Coordination requires trust in partners, institutions, and processes. Outbreak ecologies often reward suspicion: "don't trust them," "they're lying," "they're captured." Suspicion may sometimes be warranted, but chronic suspicion prevents joint action even on shared interests.

Moral sorting converts policy disputes into identity wars. Once a topic becomes a purity test, compromise becomes betrayal. Coordination across groups becomes impossible because each side believes the other is evil, not merely mistaken.

Rapid mobilization outruns planning. Outbreaks can mobilize crowds quickly, but crowds mobilized by emotion often lack stable strategy. Institutions are forced to respond to waves rather than to plans. Governance becomes firefighting.

Feedback escalation creates runaway conflict. One outbreak's action triggers the other's retaliation, which triggers further escalation. The system enters a tit-for-tat spiral without a stable stopping rule.

None of these mechanisms require an autonomous machine goal. They require only that humans be placed in a high-speed, high-emotion, low-trust environment where contagious packages compete for dominance. In such an environment, the system can degrade into chronic crisis—fragmented reality, weakened institutions, and failing coordination—even if every human actor believes they are defending truth or justice.

9.5 The turbulence ratchet: why repeated waves weaken shared norms

The final mechanism is temporal: repeated outbreaks weaken norms over time. This is the turbulence ratchet. Each wave of contagion does not merely cause a transient disturbance; it erodes the baseline conditions that would make recovery possible.

Several ratchets operate.

Attention ratchet: repeated crises train people to expect constant urgency. Patience becomes rare. Slow verification feels intolerable. The public becomes addicted to immediacy, which further rewards outbreak dynamics.

Cynicism ratchet: repeated false alarms, distortions, and weaponized narratives teach people that nothing is trustworthy. Cynicism becomes a protective stance, but it also destroys the possibility of shared procedure. When everyone believes everyone else is lying, coordination becomes impossible.

Aggression ratchet: repeated humiliation loops normalize cruelty. People become desensitized to public shaming and threats. What once felt unacceptable becomes routine. This raises the baseline hostility of discourse, increasing the likelihood that future outbreaks become antisocial.

Institutional legitimacy ratchet: each outbreak that forces institutions to speak prematurely, make errors, or appear captured reduces public trust. Reduced trust increases the next outbreak's power, because institutional correction is discounted.

Identity hardening ratchet: repeated waves push people into permanent factions. The cost of switching frames grows. Social life becomes organized around alignment rather than inquiry. This reduces the capacity for cultural learning and increases the probability of conflict.

As these ratchets accumulate, society becomes more outbreak-prone. The threshold for ignition drops. The half-life of polarizing frames increases. Stabilizing norms—restraint, fairness, patience, procedural legitimacy—lose their binding force.

This is what “civilization breakdown” can mean in the idea contagion framework: not a single catastrophic event, but a chronic weakening of shared reality and shared restraint under repeated contagion waves. Patient 0 episodes matter because they are early indicators of the load profile the system is imposing on humans. Institutional lag matters because it ensures that outbreaks evolve before correction. Mixed ecology matters because competition selects for emotionally potent strains. Together, these mechanisms can produce a society that is permanently in crisis mode—without any rogue autonomy, without paperclips, and without a single villain—simply because the environment selects for contagious packages faster than human systems can verify, integrate, and coordinate around them.

The next section turns to measurement: how to study these dynamics empirically, what metrics can approximate spread and mutation, how to track effects on behavior and institutions, and what ethical limits constrain measurement in live networks.

10. Studying Patient 0 and Idea Contagion

A concept becomes usable when it can be studied. The challenge with idea contagion is that the phenomenon is both measurable and ethically fraught. It is measurable because network transmission leaves traces: posts, shares, cascades, citation chains, and time series of attention. It is fraught because measurement can become manipulation. If we can quantify infectiousness, we can also optimize it. If we can identify “susceptible” groups, we can also target them. And if we can map Patient 0 dynamics, we can also build playbooks that either protect originators or exploit them.

This section proposes a research approach that is rigorous enough to generate insight while remaining cautious about dual-use. The intent is descriptive: to build metrics that illuminate the outbreak regime and to identify effect pathways from individual episodes to systemic stress. A full science of idea contagion would likely combine network science, computational social science, psychology, ethnography, and institutional analysis. What follows is a practical starting vocabulary: what can be measured, what can be inferred, and what should be avoided.

10.1 Measuring spread: cascades, reproduction proxies, mutation rate, half-life

The first step is to quantify spread without pretending that ideas are viruses in a literal biological sense. We can borrow analogs carefully.

Cascades are the basic unit of observable spread. A cascade is a branching sequence of shares, reposts, quote-posts, or forwards that can be represented as a tree. Cascade depth captures how many “generations” of sharing occur. Cascade breadth captures how many shares occur at a given generation. Cascade shape matters: some ideas spread in deep chains through tight communities; others spread in broad bursts via super-spreaders.

Reproduction proxies estimate how many new sharers each existing sharer generates over a time window. A crude proxy is the ratio of secondary shares to primary shares over a defined interval, adjusted for platform effects. A better proxy separates exposure from conversion: how many people saw the content, and how many then shared it. The goal is not a single magic number but a comparative lens: which packages, in which communities, under which formats, show higher conversion from exposure to replication.

Mutation rate measures how quickly and how much the package changes as it spreads. Mutation can be operationalized by comparing text similarity across reposts, by tracking changes in key phrases, by mapping which claims persist and which drift, and by identifying the emergence of new sub-frames or new enemies. In meme-like outbreaks, the “core” may remain constant while images and slogans change. In discourse outbreaks, the “core” may drift as the package is adapted to local priors. Mutation rate is a key descriptor because high mutation can increase reach while also increasing distortion and conflict.

Half-life describes attention decay: the time it takes for activity around a package to fall by half after peak. Half-life can be measured in views, shares, mentions, or related search activity. Some outbreaks have short half-lives but can be reactivated by triggers. Others have long half-lives because they become enduring frames used to interpret new events.

A practical methodological point: these metrics should be reported by platform and community cluster. Aggregating across “the internet” can hide the true dynamics because outbreaks often burn intensely within one cluster and barely register elsewhere until a bridge node transfers the strain.

10.2 Measuring effects: behavior change, institutional stress, coordination outcomes

Spread metrics alone are insufficient. A harmless meme can spread widely without major consequence. A narrow outbreak can have large effects if it reaches key institutions. Effect measurement must therefore track outcomes beyond attention.

Behavior change is the most direct. Researchers can look for correlations between outbreak exposure and observable actions: donations, attendance at events, purchases, boycotts, harassment incidents, reporting behavior, or voting patterns where data exists. Behavior is harder to measure than sharing, but it is the core of effect profile: what the package recruits people to do.

Institutional stress can be measured by the burden imposed on organizations: spikes in complaints, inquiries, threats, moderation load, legal actions, resignations, emergency meetings, public statements, and policy changes. Stress metrics can be gathered from public records, internal logs where available, or structured interviews. The key is not to assume that

institutional response equals institutional truth; institutions often respond to pressure rather than evidence. But pressure itself is a measurable effect.

Coordination outcomes capture whether the outbreak increases or decreases a group's ability to act together. Coordination can improve through prosocial contagions (shared procedures, reduced conflict) or degrade through antisocial contagions (polarization, distrust). Measuring coordination is challenging, but proxies exist: cross-group collaboration rates, legislative productivity, community conflict indicators, compliance with shared rules, or the stability of coalitions over time.

For Patient 0 specifically, effects include personal load indicators: time-to-sleep-loss after release, engagement intensity, harassment exposure, and rapid role entrapment (being cast as hero/villain). These can be studied in aggregate through anonymized surveys of creators, moderators, journalists, and researchers who have experienced outbreak events, without needing to turn any individual into a spectacle.

10.3 Qualitative strain mapping: how the package mutates across subcultures

Quantitative metrics can show that spread happened. They often cannot show what the idea became. Qualitative strain mapping fills that gap by treating an outbreak as a family of variants and then describing how each subculture interprets and reshapes the package.

A strain map begins with the "index package": the earliest identifiable formulation released by Patient 0 or the first major super-spreader. From there, researchers sample the package as it appears in different communities, platforms, and languages. The goal is to identify:

The stable core. What remains consistent across variants? This may be a slogan, an enemy image, a moral dichotomy, or a causal claim.

The adaptive shell. What changes to fit local priors? Some communities add scientific tone. Others add religious tone. Others add political tribal cues. The same package can be reframed as technical, moral, or conspiratorial depending on the audience.

The action structure. What does each community do with the package? Does it recruit verification and restraint, or does it recruit punishment and escalation? This is where archetypes become visible empirically.

The bridge transformations. How does the package change as it crosses into a new cluster? Bridge nodes often perform translation that increases fitness but also increases distortion. Mapping these transformations reveals how outbreaks become multi-cluster phenomena.

Qualitative mapping also clarifies why debates become incoherent: people are not arguing about the same thing. They are reacting to different strains in the same family. A strain map

makes those differences visible and reduces the temptation to treat “the idea” as a single stable object.

10.4 Experimental designs: framing shifts, belief updating, friction effects

Experimental approaches can test causal mechanisms, but they must be designed with care because experiments can become tools for manipulation. The goal here is to outline what could be studied without building a contagion weapon.

Framing shift experiments test how different presentations of the same claim change adoption thresholds and action structures. Researchers can vary the frame (enemy vs shared fate, urgency vs patience, certainty vs bounded uncertainty) while holding the core claim constant. Outcomes can include sharing intent, perceived truth, perceived moral obligation, and willingness to engage in constructive vs punitive actions. These experiments illuminate which frames recruit prosocial vs antisocial behavior.

Belief updating experiments test how people respond to new evidence after adopting a frame. Participants can be exposed to an initial package and then to corrective information or nuance. The key variable is identity binding: once adoption is public or socially reinforced, updating becomes harder. Experiments can test whether certain packaging features—humility cues, procedural norms, explicit uncertainty ranges—reduce lock-in and increase correction acceptance.

Friction effect experiments test how small costs alter spread. Introducing small delays, prompts to read before sharing, or reminders of uncertainty can reduce impulsive replication. The point is not to advocate specific platform policies in this paper, but to measure whether friction changes exposure-to-adoption conversion and whether it changes the dominant action structure. In outbreak regimes, tiny frictions can have large effects by breaking the automaticity of sharing.

A key constraint is that experimental work should avoid producing the most infectious variants as an output. Researchers can study mechanism by examining differential effects of framing without publishing optimized templates that could be exploited.

10.5 Limits and ethics: privacy, observer effects, dual-use asymmetries

Studying idea contagion confronts ethical limits that are not optional.

Privacy is the first. Outbreak analysis often relies on public data, but public visibility does not eliminate ethical obligations. Mapping individuals, diagnosing creators, or exposing private messages can cause harm and can itself become outbreak fuel. Patient 0 research must avoid turning originators into specimens. Anonymization and aggregation are essential, and researchers should be wary of “re-identification” through context.

Observer effects are the second. Studying an outbreak can change it. Publicizing metrics and strain maps can amplify the package, legitimize it, or provoke backlash. Researchers must treat publication as an intervention, not a neutral act. Even accurate analysis can become accelerant if it draws attention to a previously contained outbreak.

Dual-use asymmetries are the third and most serious. The same knowledge that helps protect societies can be used to weaponize contagion. Measuring what makes packages portable, identifying which communities have low adoption thresholds, and discovering which frames maximize certainty can be exploited by propagandists, grifters, and political actors. The centaur era intensifies this risk because optimization tools are widely available. A responsible research program therefore must practice selective disclosure: publish enough to illuminate the regime without providing step-by-step recipes for maximized virality.

Finally, there is a moral hazard: if institutions use contagion science to justify censorship or to pathologize dissent, the framework becomes an instrument of suppression rather than understanding. The orthogonality principle is a guard against that misuse: contagiousness does not imply falsity, and destabilization does not imply irrationality. Studying the phenomenon should preserve that distinction and avoid collapsing analysis into control.

The outcome of this section is a methodological posture: track spread, track effects, map strains, test mechanisms cautiously, and treat ethics as part of the model rather than as an afterthought. With measurement tools in place, the paper can then describe stabilizers and failure modes in a more grounded way: what conditions reduce harmful action structures, what buffers protect Patient 0 and early adopters, and how institutions can adapt to outbreak regimes without confusing truth with virality or discipline with suppression.

11. Stabilizers and Failure Modes

If idea contagion is a regime, then “stability” is not a single virtue or a single institution. It is an ecology: interacting variables that raise or lower the probability that outbreaks become destructive, that Patient 0 collapses under load, and that societies lose shared norms under repeated waves. Stabilizers are the conditions that slow runaway dynamics, reduce mutation into antisocial strains, and keep truth-seeking procedures intact long enough for verification to matter. Failure modes are the characteristic breakdown patterns that convert a manageable outbreak into a cascading conflict event.

A key theme of this section is asymmetry. In outbreak environments, the accelerants are cheap and fast: outrage, certainty, shaming, and clip-based distortion. The stabilizers are slower and often invisible: sleep, social support, interpretive humility, editorial friction, procedural legitimacy, and “slow channels” where ideas can be evaluated without being forced into

immediate performance. The centaur era does not eliminate stabilizers. It changes their relative strength. The practical question becomes: which stabilizers still work under network speed, and which failure modes are now common enough to treat as predictable rather than exceptional?

11.1 Protective variables as ecology: sleep, social support, interpretive humility

Protective variables are often treated as individual traits. In outbreak regimes, they function more like ecological conditions: they determine how much load a person or community can carry before destabilizing.

Sleep is the simplest protective variable and one of the most decisive. Outbreak dynamics reward continuous engagement: "respond now," "clarify now," "defend now." The result is sustained arousal and shortened recovery cycles. Sleep loss increases emotional reactivity, narrows attention, increases threat perception, and reduces the capacity to hold nuance under pressure. For Patient 0, sleep can be the difference between a contained episode and a cascading breakdown, because the release moment stacks maximum salience, maximum agency, and maximum feedback. A society that normalizes always-on response creates a predictable vulnerability: the originator becomes physiologically unable to regulate under the same conditions that the outbreak demands they stay online.

Social support is the second protective variable. Support is not mere comfort; it is load-sharing. A supportive peer group can absorb tasks that otherwise fall entirely on Patient 0: sorting feedback, filtering threats, sanity-checking interpretations, and preventing the originator from being pulled into endless reply cycles. Support also provides reality anchoring: trusted people can slow the drift toward totalizing frames and reduce the emotional monopolization of the outbreak. In outbreak regimes, isolation is an accelerant; support is a buffer.

Interpretive humility is the third protective variable and the most countercultural. Humility here is not a moral performance. It is a cognitive stance: the refusal to treat coherence as evidence, the willingness to bound claims, and the willingness to delay action until consequences are considered. Humility reduces the spread advantage of early certainty, but it increases resilience against later correction shock. It also reduces escalation because humility is harder to weaponize into a purity test. In a mixed outbreak ecology, humility functions like damping: it does not stop motion, but it prevents runaway amplitude.

These protective variables interact. Sleep enables humility by restoring cognitive flexibility. Support protects sleep by preventing continuous engagement. Humility reduces social threat exposure by lowering the need to dominate the narrative. Taken together, they form a small ecology of resilience that can keep Patient 0 functional even when the idea remains high-salience and the network remains hostile.

11.2 Buffering mechanisms: communities, editors, institutions, slow channels

If individual protective variables are micro-stabilizers, buffering mechanisms are meso- and macro-stabilizers: structures that slow the outbreak, shape its dominant strain, and share the burden of interpretation.

Communities can buffer when they enforce norms that reduce antisocial action structures. A community that refuses humiliation loops, discourages enemy construction, and insists on bounded claims can keep an outbreak from mutating into a scapegoating engine. Communities can also create safe rehearsal spaces: places where a package can be tested, criticized, and refined without being thrown into the full attention market. This is the difference between private incubation and public release, but at the group level: a "semi-private" layer where feedback is real yet not viral.

Editors and curators are a classic buffering mechanism that becomes newly valuable. Editorial function is not censorship; it is shaping under responsibility. Editors can insist on clarity about what is known, what is inferred, and what is still unknown. They can separate claims from frames and refuse manipulative packaging. They can also slow release: not indefinitely, but enough to reintroduce verification friction. In outbreak regimes, editorial friction is one of the few ways to keep time-to-impact from outrunning time-to-verification by orders of magnitude.

Institutions buffer when they retain procedural legitimacy and communicate in a way that does not feed outrage selection. Their challenge is severe: they move slowly and are often distrusted. Yet the alternative is worse: a public sphere governed entirely by influencer verdicts and algorithmic selection. The most important institutional buffering function is not to declare truth instantly, but to preserve a shared procedure for determining truth—auditable methods, transparent corrections, and disciplined uncertainty language.

Slow channels are the infrastructural stabilizers. These include long-form publication, moderated forums, closed discussion groups, seminars, and processes that make immediate virality harder. Slow channels do not eliminate spread; they change the dominant strain by selecting for explanations that can survive sustained scrutiny rather than just clips. They also protect Patient 0 by reducing the pressure to perform certainty instantly.

A crucial point is that buffering mechanisms must be layered. No single buffer can defeat a mixed outbreak ecology. But layers can change the regime: community norms can prevent antisocial mutations; editors can reduce premature certainty; institutions can preserve procedure; slow channels can align impact time with verification time.

11.3 Failure modes: backlash cascades, doxxing dynamics, moral panic coupling

Failure modes are not rare accidents in outbreak regimes. They are recurring patterns produced by predictable incentives.

Backlash cascades occur when early reactions are dominated by condemnation rather than inquiry. A cascade forms when critique becomes performative: people attack not to clarify but to signal belonging. The cascade accelerates because attacks generate engagement, engagement increases visibility, and visibility recruits more attackers. The package becomes secondary; the social punishment becomes the content. For Patient 0, backlash cascades are particularly destabilizing because they collapse multiple stressors into one window: reputational threat, perceived injustice, and the demand to respond continuously.

Doxxing dynamics are a severe failure mode because they convert discourse into personal vulnerability. Once private information is weaponized, the outbreak shifts from symbolic conflict to material threat. Threat perception changes behavior: sleep collapses, attention narrows, and the originator's world becomes dominated by defense. Even when the doxxing is partial or false, the fear of escalation can trigger the same destabilizing load. Doxxing dynamics also recruit further conflict because they morally polarize observers: some frame it as deserved punishment; others frame it as proof of persecution. Either way, the outbreak intensifies.

Moral panic coupling occurs when a contagious package attaches to a broader fear narrative and produces disproportionate institutional reaction. The coupling can happen on either side: panic about the idea as a threat, or panic about suppression as tyranny. Moral panic coupling is dangerous because it creates policy overreaction under uncertainty: bans, purges, blanket stigmatization, or emergency measures that erode legitimacy. Once institutions act in panic mode, they become part of the outbreak narrative, which increases distrust and lowers future coordination capacity.

These failure modes share a common structure: they shift the outbreak from epistemic contest to identity warfare. Once that shift occurs, truth-value becomes less relevant to spread, and action structures become more punitive. Patient 0 becomes a symbol rather than a person, and symbolic conflicts are difficult to de-escalate because compromise is treated as betrayal.

11.4 When "help" becomes amplification: attention as accelerant

A final instability comes from a paradox: attempts to help can increase contagion. In outbreak regimes, attention is not neutral. It is fuel.

Public defense can amplify. When supporters rush to defend Patient 0 or the idea, they increase visibility, recruit counter-attacks, and sometimes harden identity binding. Defense can also accelerate responsibility shock in Patient 0: the originator feels obligated to live up to the movement forming around them.

Public debunking can also amplify. Repeating the slogan to refute it can strengthen its portability and increase familiarity. Clip-based rebuttals can inadvertently spread the most contagious strain by reproducing it in a cleaner form. Even accurate critique can function as distribution if it keeps the token circulating in high-engagement spaces.

Media coverage can amplify by converting an episode into a narrative product. The story of Patient 0 can become more contagious than the original idea because it carries drama, conflict, and moral sorting. "Help" becomes amplification when the helper treats visibility as inherently beneficial, ignoring that the outbreak ecology selects for conflict and certainty.

The deeper point is that attention is an accelerant regardless of intent. Outbreak regimes often turn good-faith interventions into fuel because the environment rewards whatever keeps the topic active. This is why stabilizers often look boring: quiet support instead of performative defense, slow evaluation instead of hot takes, bounded claims instead of totalizing frames. It is also why the first wave is so consequential: early attempts to "help" can accidentally lock in the dominant strain by increasing repetition and polarizing identity alignment.

In the centaur era, this paradox intensifies because packages are already optimized for portability. Once the token is in circulation, almost any repetition can serve replication. The practical implication for analysis is not a rule to "never respond." It is a descriptive caution: in outbreak regimes, the medium treats attention as energy. Interventions that increase attention must be evaluated not only by their moral intent but by their likely effect on spread, mutation, and polarization.

With stabilizers and failure modes identified, the final section can return to a closing synthesis: a vocabulary for Patient 0 as a system role, a description of idea contagion as an outbreak regime, and a clear account of how civilizational risk can emerge from repeated waves of contagious packages without any autonomous takeover—simply through erosion of shared procedures, shared reality, and shared restraint.

12. Conclusion: Naming the Centaur Epistemic Climate

The centaur era is not defined by a new kind of lie. It is defined by a new kind of *speed*, a new kind of *packaging*, and a new kind of *feedback*. Human–AI co-creation increases the supply of coherent, portable, high-affect idea packages. Network platforms increase the probability that such packages spread before they can be verified, integrated, or buffered by institutions. The result is an epistemic climate that behaves less like slow cultural diffusion and more like outbreak regimes: rapid cascades, variant families, super-spreaders, attention selection, and wave-like social turbulence.

This paper's purpose has been descriptive. It has attempted to name what is happening before deciding what to do about it: idea contagion as a transmission regime, and Patient 0 as a system role—the first host who experiences the highest load at the moment an idea crosses from private coherence into public replication. Once named, the phenomenon becomes discussable without reducing it to propaganda, misinformation, or pathology. Naming is not moral permission. It is conceptual instrumentation: a way to see the moving parts.

12.1 Restating the thesis: centaur novelty plus network speed yields outbreak regimes

The thesis can be stated simply: centaur novelty plus network speed yields outbreak regimes. The novelty is upstream. The speed is downstream. The coupling occurs at the boundary between them.

Centaur co-creation changes the upstream. A human can iterate quickly, simulate objections, refine frames, and produce multiple candidate packages in a short window. The incubation chamber generates high-fitness variants before public release. This does not guarantee truth. It does not guarantee harm. It guarantees *capacity*: more polished packages, more often, with higher portability.

Network distribution changes the downstream. The medium rewards what can be copied easily, performed socially, and engaged with emotionally. Algorithms and super-spreaders function as selection mechanisms. Variant formation becomes rapid because copying is imperfect and because communities adapt packages to local priors. The public sphere becomes an evolutionary environment, not a deliberative forum.

Outbreak regimes arise when these changes meet. An idea does not need to be false to spread. It needs to be portable and emotionally recruitable. An idea does not need to be malicious to cause harm. It needs an action structure that recruits escalation or destabilization. And an idea does not need to be provable to have impact. It needs time-to-impact shorter than time-to-verification. The centaur era makes these conditions more frequent.

12.2 What Patient 0 clarifies about responsibility, timing, and impact

Patient 0 clarifies a misread that dominates modern discourse: we often treat downstream consequences as proof of upstream intent. Patient 0 shows how consequences can emerge even when intent is sincere and even when the core idea is likely true.

Responsibility becomes clearer when seen through the Patient 0 lens. The originator is not responsible for every mutation and weaponization of the package, but they are responsible for releasing a transmissible object into a selection environment. In outbreak regimes, release is not merely "sharing thoughts." It is initiating a cascade. Responsibility therefore includes timing, framing, and boundary setting. This is not a demand for censorship. It is an acknowledgment that in a low-friction medium, publication is a kind of action with systemic effects.

Timing is central because the release moment stacks the load. Patient 0 experiences maximum salience, maximum agency, and maximum feedback in the same window. Even a robust person can destabilize under that load. The episode, if visible, then becomes a social signal that fuels further spread and polarization. Patient 0 therefore functions as an early indicator of outbreak intensity: when the originator collapses, it suggests the ecology has reached a load profile that exceeds normal human buffers.

Impact is clarified by orthogonality. An idea's truth-value and its effect profile are distinct. Patient 0 episodes underline the point: functional collapse is not an epistemic refutation. It is a signal of overload. Likewise, rapid spread is not verification. It is selection. Patient 0 helps us see that outbreaks can be driven by coherence, identity binding, and emotion long before evidence is settled, and that a true claim can still destabilize if its outbreak form recruits panic, punishment, or unbounded responsibility.

In short, Patient 0 makes visible the new burden placed on originators: they are no longer simply writers or thinkers. They can become involuntary nodes in a high-speed social system, punished or exalted faster than any institution can buffer.

12.3 Open questions: verification capacity, institutional adaptation, cultural selection
Naming the climate opens research questions that are not answered by ideology.

Verification capacity is the first. Can societies increase their ability to verify claims at speed without collapsing into censorship or into influencer rule? What forms of evidence can travel at network speed, and what forms cannot? How can uncertainty be communicated without being treated as weakness or capture? These questions are technical and cultural. They involve methods, tools, and norms.

Institutional adaptation is the second. Institutions are slow for reasons that protect accuracy and legitimacy, but outbreak regimes punish slowness. What institutional designs can preserve procedural integrity while responding quickly enough to prevent narrative capture by early variants? How can institutions avoid becoming accelerants—through premature statements, performative certainty, or panic responses—while still providing real buffering and guidance?

Cultural selection is the third. Outbreak ecologies select for certain package shapes: certainty, outrage, identity sorting, enemy construction. Over time, do cultures adapt by strengthening stabilizers—humility norms, slow channels, editorial friction—or do they drift toward permanent turbulence? This is not only a question about platforms. It is a question about what people reward and what they tolerate. A society's long-run trajectory may be determined less by any single outbreak and more by which action structures become culturally prestigious.

A further question sits underneath all three: can prosocial contagions be made fit enough to compete? Coordination protocols and nonviolent norms have lower engagement fitness in

many contexts. If they cannot spread, then the ecology will be dominated by antisocial strains even when most people prefer peace. That would be a structural tragedy: the medium selecting for conflict regardless of collective desire.

12.4 Closing claim: the future is shaped by which packages become contagious first

The closing claim is not fatalism. It is a statement about path dependence in outbreak regimes: early contagious packages set frames, define enemies, establish vocabulary, and harden identities before verification and governance can respond. The first dominant strain becomes the lens through which later evidence is interpreted. Once frames harden, corrections are reinterpreted as attacks. Once institutions are distrusted, procedure collapses. Once humiliation is normalized, restraint becomes rare.

In that sense, the future is shaped by which packages become contagious first—not because early packages are necessarily true, but because early packages establish the emotional and procedural grammar of the public sphere. They determine whether uncertainty is met with patience or panic, whether disagreement is met with inquiry or punishment, and whether coordination remains possible.

The centaur era therefore raises a new civilizational task: not to eliminate novelty, and not to suppress thought, but to recognize that we now live in an outbreak-capable epistemic climate. In such a climate, the most important question is not merely “what is the next idea?” It is “what action structure will the next contagious idea recruit?” Because once an outbreak begins, it will not wait for our verdicts. It will select its own dominant strain. And by the time we decide what we think, the world may already have moved.

Appendix A: A Minimal Load Model for Patient 0

This appendix proposes a compact way to describe why Patient 0 can destabilize at release without turning the episode into a moral verdict or a diagnostic label. The goal is not clinical precision. The goal is a usable load vocabulary that separates (a) the epistemic status of the idea from (b) the human capacity to carry outbreak-level consequences in real time.

The model treats Patient 0 destabilization as an overload event produced by stacked variables. If enough variables spike together, an acute episode can occur even in a capable, intelligent, psychologically ordinary person. This framing is deliberately non-pathologizing: it describes *conditions* rather than *defects*.

A.1 Variables: novelty, stakes, speed, exposure, hostility, recovery capacity

A minimal load model can be expressed as an interaction among six variables. Think of them as dials that can rise or fall.

Novelty

Novelty is how unfamiliar the idea is to the originator and to the surrounding culture. High novelty increases cognitive load because there are fewer established priors, fewer rehearsed explanations, and fewer stable social scripts for how to talk about the idea. Novelty also increases meaning shock: the originator may feel they are at a threshold event rather than simply making a contribution.

Stakes

Stakes are the perceived implications if the idea is correct, adopted, or acted upon. Stakes can be moral (harm, justice), existential (identity, worldview), political (power, legitimacy), or personal (reputation, livelihood). High stakes increase arousal, urgency, and responsibility shock. Stakes can be high even when the idea is true; in fact, true ideas can carry the highest stakes because they demand real change.

Speed

Speed is the pace at which (a) the originator iterates internally and (b) the public reacts externally. Speed compresses time-to-impact. It reduces reflection windows, sleep windows, and integration windows. High speed is not just “fast posting.” It is the collapse of the gap between thought, release, and consequence.

Exposure

Exposure is the volume and density of incoming feedback signals: views, comments, quote-posts, messages, news mentions, and requests. Exposure includes both quantity and synchronization—how many signals arrive in a short time window. Synchronized exposure is especially destabilizing because it produces the feeling of being surrounded, judged, and demanded-from all at once.

Hostility
Hostility is the proportion and intensity of adversarial feedback: contempt, shaming, threats, pile-ons, distortions, and accusations. Hostility increases perceived threat and narrows attention. It also increases identity binding because it pushes the originator toward defensive certainty and toward faction alignment ("I must choose a side and fight"). Hostility can be high whether the idea is true or false; it often tracks threat to identity and power rather than epistemic status.

Recovery capacity
Recovery capacity is the originator's ability to restore baseline functioning: sleep, nutrition, emotional regulation, social support, and the ability to disengage. Recovery capacity is not "strength of character." It is an ecological resource. It depends on life circumstances, support networks, platform exposure, and the person's ability to set boundaries. Recovery capacity can be temporarily reduced by ordinary factors: travel, illness, stress, isolation, or simply staying online too long.

A practical way to use the model is to treat Patient 0 risk as rising when multiple variables peak simultaneously. High novelty + high stakes + high speed + high exposure + high hostility, paired with low recovery capacity, creates a load configuration in which acute destabilization becomes unsurprising.

A.2 Interpreting spikes: why acute episodes can occur without "false belief"
The load model is meant to clarify a common misinterpretation: observers often treat acute destabilization as evidence that the originator "must be wrong" or "must be irrational." That inference is structurally unreliable.

Spikes occur because outbreak regimes synchronize stressors. The originator experiences a surge of salience and responsibility at the same time the network delivers a surge of judgment and demand. Even if the underlying claim is true, the originator may still be pushed into a state of physiological overactivation: heightened arousal, reduced sleep, narrowed attention, and reduced tolerance for ambiguity. These states can produce functional impairment—poor decision-making, panic, emotional volatility, tunnel vision—without requiring any fixed false belief.

The model therefore recommends a different interpretive default: treat acute episodes as evidence of load, not as verdicts on truth. This protects inquiry (by not confusing mental state with epistemic status) and it protects people (by not moralizing overload as failure).

Appendix B: Case Study Template for an Idea Outbreak

This template is designed to document an outbreak in a way that preserves orthogonality: separating truth-value questions from effect-profile questions, and separating the originator's experience from the package's public evolution. It is deliberately modular so that multiple outbreaks can be compared across cases.

B.1 The package: claim, frame, call to action

Claim

State the core claim as a single sentence and as a bounded paragraph. Identify whether it is descriptive ("X is happening"), causal ("X causes Y"), predictive ("X will lead to Y"), or prescriptive ("we should do X").

Frame

Describe the interpretive lens the package supplies. What metaphors are used? What dichotomies appear? What counts as evidence inside the frame? What authorities are invoked or rejected? What is treated as obvious?

Call to action

List the actions the package recruits. Distinguish between epistemic actions (verify, read, test), social actions (share, recruit, shame), and material actions (donate, protest, boycott, retaliate). Note whether the call is bounded or open-ended.

B.2 The release: initial conditions and first feedback

Origin context

Where did the package originate (centaur loop, individual author, organization)? What was the originator's stated intent? What was the initial audience?

Release form

What format was used (thread, video, essay, meme, screenshot)? What was the initial token or slogan? What was the first "portable unit" that traveled?

First feedback window

Document the first 24–72 hours: volume of attention, tone distribution (supportive/hostile/mixed), and whether early responses were primarily inquiry, ridicule, condemnation, or mobilization.

Patient 0 load indicators (if relevant and ethically available)

Describe observable load: engagement intensity, sleep disruption cues, role entrapment, threats, or withdrawal. Avoid diagnostic language; focus on events and behaviors.

B.3 The cascade: channels, super-spreaders, variants

Channels

List the platforms and communities where the outbreak spread. Identify which clusters were primary ignition points and which were later imports.

Super-spreaders and bridge nodes

Identify the major amplifiers and the bridge transformations they performed. What changed when the package crossed clusters?

Variant family

Document major strains: supportive strain, hostile strain, satirical strain, extremist strain, institutional strain. Note what the stable core remained and what mutated.

Mutation dynamics

Describe how the package changed: simplification, enemy construction, certainty inflation, moralization, technicalization, or narrative dramatization.

B.4 Effects: individual, community, institutional, coordination outcomes

Individual effects

Any documented stress, harassment, or disruption among originators and early adopters (again, non-diagnostic). Include both harmful and beneficial outcomes (e.g., constructive community formation).

Community effects

Changes in group norms: increased policing, increased empathy, increased hostility, new vocabulary adoption, faction splits, or new coordination protocols.

Institutional effects

Statements, policy shifts, moderation actions, investigations, legal activity, resignations, or reputational impacts. Note institutional lag relative to outbreak peak.

Coordination outcomes

Did the outbreak improve coordination (shared procedures, reconciliation) or degrade it (polarization, trust collapse)? Identify whether coordination failure occurred and through what pathway.

Appendix C: Glossary

This glossary defines terms as used in this paper. The definitions are descriptive and tailored to outbreak regimes in the centaur epistemic climate.

C.1 Patient 0, shedding, super-spreader, variant, half-life, strain family, buffering

Patient 0

The first human host in the centaur loop who releases an outbreak-capable idea package into a public network and therefore experiences maximum load at the boundary between private convergence and public replication.

Shedding

The act of transmitting the package to others through posting, forwarding, repeating, or embedding it in new content. Shedding can be intentional (evangelism) or incidental (quoting to criticize).

Super-spreader

A node (individual, account, channel, institution, or algorithmic mechanism) that produces disproportionately high secondary exposure relative to ordinary participants.

Variant

A mutated form of the package produced through paraphrase, excerpt, remix, distortion, or translation, which retains some connection to the original while changing meaning, tone, or action structure.

Half-life

The time it takes for a measurable indicator of outbreak activity (mentions, shares, views) to decay by half from its peak, acknowledging that reactivation can occur through triggers.

Strain family

The set of related variants that descend from the same origin package and compete for dominance across platforms and communities, often diverging in frame, tone, and call to action.

Buffering

Any mechanism that slows outbreak dynamics, reduces harmful mutation, shares interpretive burden, or preserves procedural legitimacy. Buffering can be individual (sleep, support), communal (norms, moderation), editorial (curation, friction), or institutional (auditable procedures, disciplined communication).

References

Youvan, D. C. (2026). *Idea Contagion in the Centaur Era: How Human-AI Co-Creation Turns Novel Ideas into Network Pandemics.* Preprint. doi: 10.13140/RG.2.2.32301.35045

Amershi, S., Weld, D., Vorvoreanu, M., Fourney, A., Nushi, B., Collisson, P., Suh, J., Iqbal, S., Bennett, P. N., Inkpen, K., Teevan, J., Kikin-Gil, R., & Horvitz, E. (2019). Guidelines for human-AI interaction. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems.*

Anderson, R. M., & May, R. M. (1991). *Infectious Diseases of Humans: Dynamics and Control.* Oxford University Press.

Aral, S., & Walker, D. (2012). Identifying influential and susceptible members of social networks. *Science, 337*(6092), 337–341. doi: 10.1126/science.1215842

Bakshy, E., Hofman, J. M., Mason, W. A., & Watts, D. J. (2011). Everyone's an influencer: Quantifying influence on Twitter. *Proceedings of the 4th ACM International Conference on Web Search and Data Mining (WSDM).*

Bakshy, E., Messing, S., & Adamic, L. A. (2015). Exposure to ideologically diverse news and opinion on Facebook. *Science, 348*(6239), 1130–1132. doi: 10.1126/science.aaa1160

Barabási, A.-L., & Albert, R. (1999). Emergence of scaling in random networks. *Science, 286*(5439), 509–512. doi: 10.1126/science.286.5439.509

Berger, J., & Milkman, K. L. (2012). What makes online content viral? *Journal of Marketing Research, 49*(2), 192–205. doi: 10.1509/jmr.10.0353

Bikhchandani, S., Hirshleifer, D., & Welch, I. (1992). A theory of fads, fashion, custom, and cultural change as informational cascades. *Journal of Political Economy, 100*(5), 992–1026.

Bostrom, N. (2014). *Superintelligence: Paths, Dangers, Strategies.* Oxford University Press.

Centola, D. (2010). The spread of behavior in an online social network experiment. *Science, 329*(5996), 1194–1197. doi: 10.1126/science.1185231

Centola, D., & Macy, M. (2007). Complex contagions and the weakness of long ties. *American Journal of Sociology, 113*(3), 702–734. doi: 10.1086/521848

Cohen, S. (1972). *Folk Devils and Moral Panics.* MacGibbon and Kee.

Covington, P., Adams, J., & Sargin, E. (2016). Deep neural networks for YouTube recommendations. *Proceedings of the 10th ACM Conference on Recommender Systems (RecSys '16).* doi: 10.1145/2959100.2959190

Dawkins, R. (1976). *The Selfish Gene.* Oxford University Press.

Dellermann, D., Ebel, P., Söllner, M., & Leimeister, J. M. (2019). Hybrid intelligence. *Business & Information Systems Engineering, 61*, 637–643.

Diekmann, O., Heesterbeek, J. A. P., & Roberts, M. G. (2010). The construction of next-generation matrices for compartmental epidemic models. *Journal of the Royal Society Interface, 7*(47), 873–885.

Eppler, M. J., & Mengis, J. (2004). The concept of information overload: A review of literature. *The Information Society, 20*(5), 325–344.

Ferrara, E., Varol, O., Davis, C., Menczer, F., & Flammini, A. (2016). The rise of social bots. *Communications of the ACM, 59*(7), 96–104. doi: 10.1145/2818717

Festinger, L. (1957). *A Theory of Cognitive Dissonance.* Stanford University Press.

Goel, S., Anderson, A., Hofman, J., & Watts, D. J. (2016). The structural virality of online diffusion. *Management Science, 62*(1), 180–196. doi: 10.1287/mnsc.2015.2158

Goode, E., & Ben-Yehuda, N. (1994). *Moral Panics: The Social Construction of Deviance.* Blackwell.

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360–1380.

Granovetter, M. S. (1978). Threshold models of collective behavior. *American Journal of Sociology, 83*(6), 1420–1443.

Kahneman, D. (2011). *Thinking, Fast and Slow.* Farrar, Straus and Giroux.

Kasparov, G. (2017). *Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins.* PublicAffairs.

Kermack, W. O., & McKendrick, A. G. (1927). A contribution to the mathematical theory of epidemics. *Proceedings of the Royal Society A, 115*, 700–721.

Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences, 111*(24), 8788–8790. doi: 10.1073/pnas.1320040111

Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin, 108*(3), 480–498. doi: 10.1037/0033-2909.108.3.480

Lazer, D. M. J., Baum, M. A., Benkler, Y., Berinsky, A. J., Greenhill, K. M., Menczer, F., Metzger, M. J., Nyhan, B., Pennycook, G., Rothschild, D., Schudson, M., Sloman, S. A., Sunstein, C. R.,

Thorson, E. A., Watts, D. J., & Zittrain, J. L. (2018). The science of fake news. *Science, 359*(6380), 1094–1096. doi: 10.1126/science.aao2998

Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research. *Psychological Bulletin, 110*(3), 406–425.

Newman, M. E. J. (2002). Spread of epidemic disease on networks. *Physical Review E, 66*, 016128. doi: 10.1103/PhysRevE.66.016128

Nyhan, B., & Reifler, J. (2010). When corrections fail: The persistence of political misperceptions. *Political Behavior, 32*(2), 303–330. doi: 10.1007/s11109-010-9112-2

Pariser, E. (2011). *The Filter Bubble: What the Internet Is Hiding from You.* Penguin Press.

Pastor-Satorras, R., & Vespignani, A. (2001). Epidemic spreading in scale-free networks. *Physical Review Letters, 86*(14), 3200–3203. doi: 10.1103/PhysRevLett.86.3200

Pennycook, G., & Rand, D. G. (2019). Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition, 188*, 39–50.

Pennycook, G., McPhetres, J., Zhang, Y., & Rand, D. G. (2021). Shifting attention to accuracy can reduce misinformation online. *Nature, 592*, 590–595.

Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.

Shifman, L. (2013). *Memes in Digital Culture.* MIT Press.

Simon, H. A. (1971). Designing organizations for an information-rich world. In M. Greenberger (Ed.), *Computers, Communications, and the Public Interest.* Johns Hopkins University Press.

Sunstein, C. R. (2009). *Going to Extremes: How Like Minds Unite and Divide.* Oxford University Press.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*(4157), 1124–1131.

van Os, J., Kenis, G., & Rutten, B. P. F. (2010). The environment and schizophrenia. *Nature, 468*, 203–212.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science, 359*(6380), 1146–1151. doi: 10.1126/science.aap9559

Watts, D. J. (2002). A simple model of global cascades on random networks. *Proceedings of the National Academy of Sciences, 99*(9), 5766–5771. doi: 10.1073/pnas.082090499

Watts, D. J., & Strogatz, S. H. (1998). Collective dynamics of “small-world” networks. *Nature, 393*, 440–442. doi: 10.1038/30918

Watts, D. J., & Dodds, P. S. (2007). Influentials, networks, and public opinion formation. *Journal of Consumer Research, 34*(4), 441–458. doi: 10.1086/518527

World Health Organization. (2020). *Managing the COVID-19 infodemic: Promoting healthy behaviours and mitigating the harm from misinformation and disinformation.* (Statement and guidance materials.)

Zubin, J., & Spring, B. (1977). Vulnerability: A new view of schizophrenia. *Journal of Abnormal Psychology, 86*(2), 103–126.

The author has published over 4,800 AI-assisted papers at: https://www.researchgate.net/profile/Douglas-Youvan/research . Google Scholar has indexed these preprints, and if you want a particular reference, the AI mode of a Google search (Gemini) has efficiently catalogued these preprints.